AMERICAN AND SAND

JULY 1940



RESIDENTIAL AIR CONDITIONING WARM AIR HEATING . SHEET METAL CONTRACTING

ESTABLISHED 1 8 8 0

TS200

MAKE MONEY! Out of DUCT



Installations
In The Modern
LOW COST
HOME

LAMNECK makes it possible for you to contract for this profitable volume-business—even far beyond the capacity of your shop. Take this extra volume — earn these extra profits without adding one penny to your shop investment. Let Lamneck take up the slack of this business and your fall rush.

The 5% to 6% limit placed on the heating installation of F. H. A. financed homes is no barrier to these profitable gravity or forced air jobs when contractors use LAMNECK Prefabricated Pipe, Duct, and Fittings. LAMNECK saves and makes you money . . . in estimating time . . . shop time . . . material costs . . . handling and *installation* costs. You can actually determine what your total cost will be before you "go off the deep end" with casual shop estimates!

"Low Cost Housing" is a golden opportunity for alert sheet metal men who've discovered the practical advantages of Lamneck Fittings. Write today for complete information. Plan now to make your next job "Lamneck"!



LAMEDGE used on all round tin pipe, elbows, and on the round end of all tin

fittings at no additional cost to you!

The double or flange-fold ends give the made-up pipe far greater rigidity—equal to much heavier gauge metal. Assembling—fast as dropping one cone inside another. Makes assembly faster. No raw edge to cut hands in assembling fittings or adjusting elbows.

The simple locking device on the pipe eliminates the need of a pipe bar or anvil. Locks together permanently—quickly—on the job.



You ent. INC.

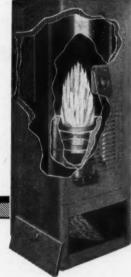
SIMPLIFIED Furnace Pipe and Fittings, and Prefabricated Duct and Fittings for All Types of Residential Warm Air Heating and Air Conditioning Systems.

LAMNECK PRODUCTS, INC.

Middletown, Ohio

Publisher's hinding

Two more reasons why you should line up with Lochinvar



THE NEW MODEL

The same design and construction as our popular Model 80. A complete winter air conditioning unit. B.T.U. output, 59,000 at bonnet. Dimensions 24" wide x 26" deep x 67" high.

- Radiator or heat economizer giving additional heating surface and reducing stack temperature to a minimum.
- Combustion chamber made of heavy boiler plate steel. All seams welded gas and air tight.
- Direct driven, three-speed blower, assuring you of noiseless operation and minimum vibration.
- Can be installed either in basements or utility rooms
- Furnace shipped complete with Multiple-Stage Burner and all controls.
 Casing finished with Hammer Metal enamel.

LOCHINVAR has added two more models to its line of furnaces for the volume market, the Model 60 and 60G. They fill a very definite need for automatic oil burning furnaces in the smaller home market.

Like all Lochinvar equipment they are shipped complete with the exclusive Lochinvar Multiple-Stage Burner, and like all Lochinvar equipment they follow the Lochinvar formula, that if automatic heating equipment is to be sold to the low priced home volume market it must be priced in proportion to the cost of the home and at the same time be constructed and designed to give the same heating satisfaction as the furnace costing many times more.

If you are interested in reaching the volume market, line up with Lochinvar. The prices are the lowest, quality the best—so fill in the coupon below and mail it to us today.



THE NEW MODEL 60G

Complete automatic, oil burning, warm air gravity furnace. B.T.U. output at bonnet 59,000.



CASH IN ON THESE OIL BURNING WATER HEATERS

If you want to realize bigger profits on water heater sales this summer, you can't go wrong if you handle Lochinvar's improved oil burning water heaters. They have everything licked on the market in price, performance and low cost of operation. They are attractively finished in gray enamel with maroon trim, and are available in 20, 30, 40 and 50 gallon sizes. For further information about them send in this coupon.

All Lochinvar equipment listed as standard by Underwriters' Laboratories.

LOCHINVAR PRODUCTS
LOCHINVAR PRODUCTS
LOCHINVAR PRODUCTS
LOCHINVAR Avenue
14247 Tireman Avenue
14247 T

Lochinvar products

4247 TIREMAN AVENUE

DEARBORN, MICHIGAN

AMERICAN ARTISAN

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

WITH WHICH ARE MERGED

FURNACES SHEET METALS

Warm-Air Heating

J. D. Wilder, Editor		A. A. Kennedy, Assistant Editor		
Vol. 109, No. 7	July, 194	Founde	ed 1880	
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In This Issue

THIS month's cover, typical of the better type of low cost houses being built, shows houses in Scarsdale, N. Y. The photograph was supplied by American Builder

was supplied by American Builder magazine, Chicago.

We also call attention to the low cost houses shown on the cover of the Low Cost House Section, page 65. The photograph (by Portland Communication) Portland Cement Ass'n, Chicago) shows small houses built of concrete products.

The photograph on the Air Conditioning Section cover shows an attic fan window display of Houston (Texas) Lighting and Power Company. The company has been unusually active in promoting attic fan sales and helping dealers.

So much comment is going the rounds relative to proportionate costs allocated to heating in low cost houses that we asked Arnold Kruckman to write the facts as Washington sees them. His reon page 34 is especially timely.

To find attic ventilation reports quickly, we visited the Southwest in May. Down there attic fans are sold in numbers which make northern areas seem backward. Two typical contractor's activities are reported in this issue. Brice Gaston's program is reported on page 44. Lansdowne and Moody furnish a church cooling job on page 40.

Carter Cole's second article on proper application of copper roofing is on page 51. The problem of expansion, especially at gutters forms the theme. All phases of proper application will be covered in the covered in th in the series.

Down South one firm in Houston has installed some 1,500 light weight (3 oz.) copper roofs on resi-dences. How they do it and how they apply the material is reparted on page 60.

Member of Audit Bureau of Circulations - Member Associated Business Papers, Inc.

Published monthly by Keeney Publishing Company, 6 North Michigan Ave., Chicago, Ill., U. S. A. Branch Offices—In New York, Room 1734, Grand Central Terminal Building, Murray Hill 9-8293; In Cleveland, 2128 Rossmoor Road, Cleveland Heights, Yellowstone 1540; In Los Angeles, J. H. Tinkham, 1406 S. Grand Ave., Richmond 6191. Copyright 1940 by Keeney Publishing Company—F. P. Keeney, President; W. J. Osborn, Vice President; R. Payne Wettstein, Secretary; Chas. E. Price, Treasurer. Advertising staff: Wallace J. Osborn, R. Payne Wettstein, Robert A. Jack, J. H. Tinkham, L. A. Doyle.

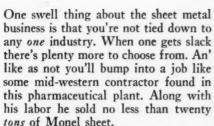
Yearly Subscription Price—U. S. and possessions, Canada, Mexico, South America, Central America, \$2.00; Foreign, \$4.00. Single copies, U. S. and possessions, \$.25. Back numbers, \$.50. January, 1940, Directory issue, \$1.00 per copy. Entered as second-class matter, July 29, 1932, at the post office at Chicago, Illinois, under the act of March 3, 1879.

More than 8,000 copies of this issue are being distributed



Jack of all Trades

BY TIM SHEARS





PHARMACEUTICAL

Considering the different kinds of industries you work for, an' the different kinds of wear an' tear they put on metal, it's lucky there's a metal like Monel... especially the new #35 sheet. Most sheet metal men tell us it forms even easier than the standard cold rolled sheet. An' you've no trouble finishing it ... that's done at the mill at no extra cost. The 24" I.D. by 36" deep alum size tanks shown above were made for a big paper company in New York state. They show the kind of job you can turn out with #35 Monel.





When it comes to gas, electric or atomic hydrogen welding, you'll find #35 Monel a cinch to work with. Also for soft soldering an' silver brazing. For instance: The steam bath at left was made out of 16 gauge Monel for experimental yarn dyeing in an eastern textile laboratory. Covered corners are electric welded both horizontally and vertically, an' it takes a good pair of eyes to find the joints.

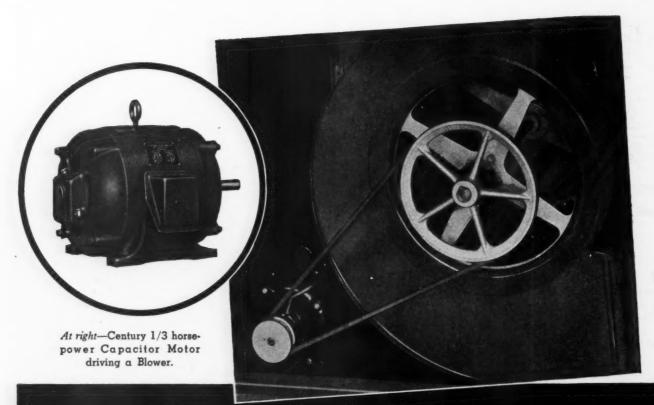
A paying proposition for any sheet metal shop is turning out neat little measuring cans in Monel. Those below at left are made of 20 gauge sheet, lock seamed. The contractor makes them for a jobber who sells them to big perfume plants for measuring essential oils. Jobs like this is just where you profit from the

swell satin finish put on #35 Monel at the factory.

In case you're missing any bets in plants like the above it might pay you to get more dope on the kind of sheet metal equipment they need. We have bulletins on all these industries that will make you a regular Jack of all Trades. If you'd like them, just drop a line to:

TIM SHEARS

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET, NEW YORK, N. Y.



Centure Multi-Speed Motors For Furnace Blowers Smooth Out the "ON" and "OFF" Heating Cycle

for

Your Convenience
Century Motor Specialists are

located in these key centers:

Atlanta • Baltimore • Boston
Buffalo • Chicago • Cincinnati • Cleveland • Dallas
Davenport • Denver • Detroit
Houston • Indianapolis • Kalamazoo • Kansas City • Los
Angeles • Milwaukee • Minneapolis • New Orleans
New York • Omaha
Philadelphia • Pittsburgh
Rochester • Salt Lake City
San Francisco • Seattle
Spokane • Tulsa

Century engineers recognize that the many variables in warm air heating problems often make it desirable to control air volume through "High" — "Low" — "Off," instead of on and off. Hence, Century has developed the multi-speed as well as the single-speed motor to meet the furnace blower and heating problems.

Where air stratification and temperature variations are problems to be solved, Century Multi-Speed Motors make available a longer period of blower operation in the heating cycle, with a choice of high or low air volume, before it shuts off.

For many years Century has specialized on the problems of correct motor application throughout the entire field of air conditioning. The extensive experience of Century engineers is always available to you.

Century manufactures motors in sizes 1/60 to 600 horsepower.

Specify Century Specific Purpose Motors on the equipment you sell.



CENTURY ELECTRIC COMPANY

1806 Pine Street

St. Louis, Missouri

One of the Largest Exclusive Motor Manufacturers in the World



NORGE Model OB-60 FASTEMP FURNACE, for example, can be installed in a \$2000 home for about the price of a good "parlor heater," yet it gives the home owner modern oil heat with a wall control and semi-automatic operation, heat delivery to two rooms and cold air returns from exposed spaces.

This Norge unit is absolutely revolutionary in its excellent quality, low cost, high efficiency, economy and compactness—and it is just one example of the great values that Norge is building into every Norge heating unit.

Here's a condensed list of Norge Package Heating Units:

MODEL 120 WINTER AIR CONDITIONER; low first cost, fully automatic, set up in 2 to 3 hours, factory wired, mechanical draft, forced filtered air, humidity, 120,000 B.T.U. at bonnet, single motor, 85% to 87% efficiency, oil or gas, basement or utility room.

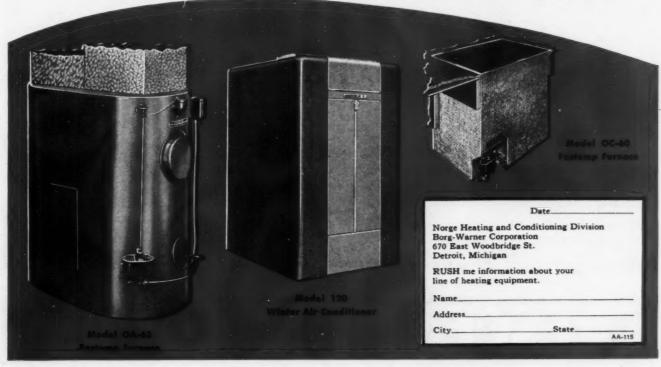
MODEL OA-63 FASTEMP FURNACE; 63,000 B.T.U., utility room, basement or pit installation. 800 C.F.M. forced air, Evenheet Wall Control, an oil-burning, central heating plant at less than the cost of an old-fashioned furnace.

MODEL OB-60 FASTEMP FURNACE; 60,000 B.T.U. gravity; basement or pit installation.

MODEL OC-60 FASTEMP FURNACE; 60,000 B.T.U. gravity floor furnace, needs only 40" pit under floor.

These four package units cover 90% of the entire heating and air conditioning market—and at unbelievably low prices. Write or wire for literature, prices and details of many new performance and durability features.

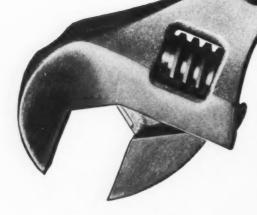
NORGE HEATING and CONDITIONING DIVISION BORG-WARNER CORPORATION DETROIT, MICH.



CRESTOLOY WRENCH

Performance
IS THE RESULT OF
QUALITY DESIGN AND
CONSTRUCTION

On



One of the primary reasons for the outstanding performance and exceptional utility of Crestoloy Wrenches is their design. But that design couldn't be possible were it not for the remarkable qualities of Crestoloy steel itself. These mod-

ern wrenches pack tremendous power and strength into a few ounces of tool that's easily handled even in cramped, awkward places.

There are no "short-cuts" in Crescent manufacture—relentless inspection interrupts the various machining and assembly steps. Final testing of random lots continuously maintains Crescent's high quality standards.

If you want real wrench value, insist on Crestoloys. Sold by hardware dealers everywhere.

CRESCENT TOOL COMPANY, JAMESTOWN, N. Y.



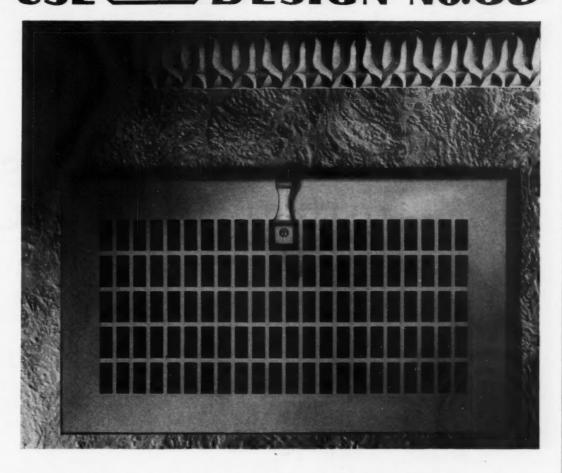
Every part checked and double-checked to maintain high-quality standards.



Specially-designed machines permi precision manufacture on a production basis.

CRESCENT and Smith & TOOLS

When LOWEST PRICE is Imperative Line is Imperative is still important ... USE DESIGN No.69



In bidding for the air conditioning of the low-priced home where bed-rock prices are imperative to getting the business, quality is still highly important. For the buyer is bound to remember you by the equipment furnished, not by the price he paid. Consequently it is mighty good business, on this class of work to use H & C No. 69 Design Register—a QUALITY item in every detail, yet priced with the lowest. No. 69 enables you to compete on any job and still furnish a register that will be a credit to you. It is attractive in appearance, affords excellent concealment of the duct, has ample free area and is furnished with sponge rubber gasket to insure streak-proof installation.

We confidently predict that if you will inspect this register at your H & C Jobber. you will also standardize on it: for the extra value supplied in No. 69 is recognizable at a glance.

HART & COOLEY MANUFACTURING CO. Warm Air Registers • Air Conditioning Grilles • Damper Regulator Sets • Dampers • Chain • Pulleys FACTORY AND ENGINEERING SALES OFFICE: HOLLAND Chicago Office: 61 W. Kinzie St. Philadelphia Office: 1600 Arch St.

Here's Our New Home!

For a while after our fire, things DID look black. Our entire plant was completely destroyed. It would take months to rebuild. We (and our trade) couldn't wait that long for more HANDY PIPE.

The "silver lining" to our cloud took the shape of this fine building—better located and better arranged than our old plant—and all ready for us to move in and start work.

A few machines and dies were salvaged—additional equipment was wired for—materials that had been enroute while the fire was burning were on hand—



This fine building at 308-318 Commercial St. and running through to 309-317 S. Water St. is our new plant. General Offices continue at 1311-13 S. Adams St.

And By The Time You See This Our Production Will Be Climbing Back to Normal — Handy Pipe



"Good Old HANDY PIPE"

will continue to be America's Standard of furnace pipe value and performance.

Service Will Be As Good As It Was Before

There will be no "fire stock" for sale—we made no attempt to even use a single tin or galvanized sheet from those in stock when the fire broke out. Every section of HANDY PIPE AND DUCT WORK produced in the new plant will be really NEW—fully up to the standards of "old reliable HANDY pipe."

So Send On Your Orders— They Will Be Cared For Promptly

F. MEYER & BRO. CO., PEORIA, ILL.



"It's the Best Dealer Set-up a man could hope for!"

(Reading time 21/2 minutes)

LISTEN to this newly appointed G-E Dealer tell his banking friend about a good investment in personal security.

"Morning J. B. Remember we talked about my taking on the General Electric lines? Well, I'm now the G-E Dealer for this area.

"Since we've been doing business together for a long time, I think you'll be interested in my new set-up.

"In the first place I can sell you and other home owners or business owners—the finest heating, cooling, air conditioning and refrigeration equipment that money can buy. That's no rash promise, either. I can prove it.

Now, I want to tell you why I settled on General Electric.

TESTED PRODUCTS

"Before they put a nickel's worth of these products on the market eight years ago, they spent five years and many thousands of dollars in their lab-

many thousands of dollars in their laboratories making them work. Designing, developing and testing.

"Every year since, they've continued to spend plenty of money making 'em even better.

"You know it's mighty useful and important to have all the resources of a company like G-E behind you. "The net result is every customer gets a working piece of machinery, that doesn't have to be serviced every few weeks. That will keep him happy for a long time to come.

A PRODUCT FOR EVERY PROSPECT

"For instance—a completely automatic warm air heating plant. Burning either gas or oil. Any combination to fit.

To operate economically. To give the last word in comfort. And which is really something special when it comes to operating and safety controls.

"Then there's the second complete line—of summer cooling units. For one room or a whole store. Whether the prospect wants to sleep better at

night or bring more customers into his store, he can do it with G-E 'packaged' air conditioning.

"And I've got still a third line with lots of prospects. For water and beverage coolers. For what the grocer or butcher or delicatessen man calls walk-in

and reach-in cabinets. And for condensing units. (There's a steady replacement business in these alone).

YEAR 'ROUND PROFITS

"There you have the three lines. As a good business man yourself, you'll agree with me that it makes sense to sell all three. Not just one as I used to.

Then when the heating season bogs down, cooling and commercial refrigeration sales step up. To me this means keeping everybody busy and year 'round

profits. You call it straightening out the sales curves.

REAL DEALER SUPPORT

"Now, in addition to good products, G-E offers a dealer special training in selling, in organizing sales, in training ser

vice groups and in engineering. The dealer is backed up by both national and trade paper advertising. He gets direct mail campaigns. Good selling

Commercial Refrigeration

literature and cooperation on local newspaper advertising. Actually— 'most everything he needs to help him do business "Well, there

you have it. You can see what it means to be a G-E dealer. Both our town and my business are going to benefit!"

GENERAL @ ELECTRIC

General Electr Div. 199-753,	ic Co. Bloomfield, N. J.
I w Dealership for	want all details on the G-E my territory.
Name	
Street	
01/664	

TOUGH DUCT JOBS BECOME

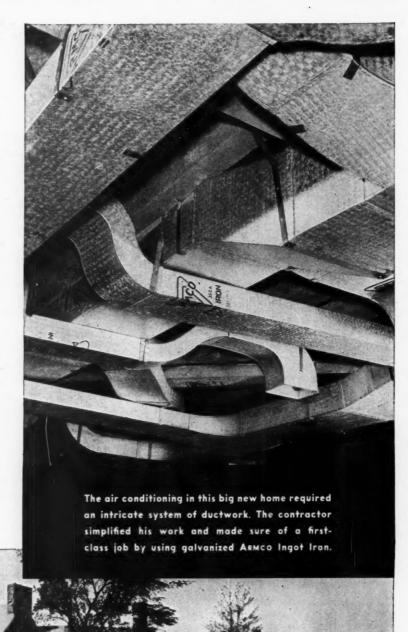
Easy and Better... THIS WAY!

• The fact that air conditioning work is getting more intricate every day makes your job harder than ever. Nowadays it takes considerable skill and a highly ductile sheet to transform working drawings into neat, accurately-formed ducts.

This is why it will pay you to use galvanized Armco Ingot Iron, one of the easiest-forming and most uniform of all iron and steel sheets. You'll find no hard spots or objectionable waviness to make your work difficult and perhaps even unsatisfactory.

This same workability also keeps down shop and erection costs—frequently to the point where you are assured of making a fair profit on the job. And once installed, galvanized Armco Ingot Iron is there to stay a long, long time. Remember, 34 years of diversified use has given this ductile, durable metal the longest record of actual service of all low-cost iron or steel sheets!

Your customers will welcome these facts. They'll appreciate that when you use galvanized Armco Ingot Iron you are giving them a better duct job, and that you are saving them time, trouble and money in the years ahead. For ducts that need painting immediately, use Armco Paintgrip sheets. Just call the nearby Armco Distributor or write us direct. The American Rolling Mill Company, 2001 Curtis St., Middletown, O.





ARMCO INGOT IRON



National magazines, such as these and many others, have for years carried the banner of Minneapolis-Honeywell and Automatic Heating . . . telling the story of amazing developments, of constantly increasing comfort and economy. . . . The background for this advertising has been the sincere conviction that the Automatic Heating Industry and Minneapolis-Honeywell are partners . . . that the great industry of automatic heating and the finest controls money can buy are inseparable. For more than half a century Minneapolis-Honeywell Controls have not only been nationally advertised, but nationally recognized. . . .

MINNEAPOLIS-HONEYWELL

Minneapolis-Honeywell Regulator Company, 2726 Fourth Ave. S., Minneapolis, Minn. Canadian Plant: Toronto, Ontario. European Plant: London, England. Company owned branches in 49 other cities.

Control Systems

NEW LOW PRICE

Easy on the Eyes — Easy to Sell

The trim, sharp lines of this amazing new unit clinches sales for builders. Mail the coupon for the facts on this Air Conditioner.

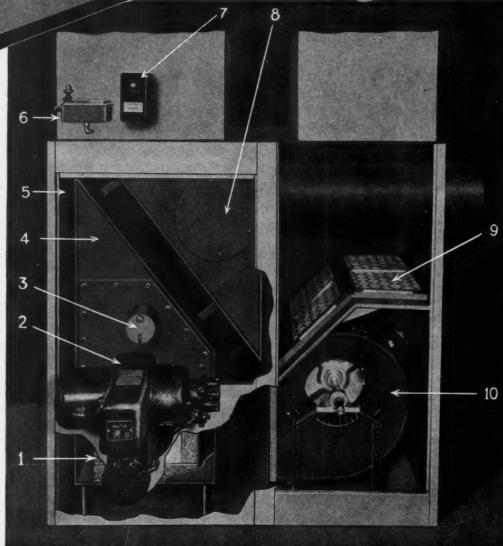
guside Story

OF THE FLUID HEAT FHA AIR CONDITIONER

This cut-away view shows the internal construction of the Fluid Heat FHA Air Conditioner. This 80,000 B.T.U. unit is built both with enclosed oil burner as shown in illustration at left or with external oil burner as in this cutaway view below.

- 1 SECTIONAL COMBUSTION CHAMBER of special Fluid Heat material. Quickly attains proper temperature for highest combustion efficiency and transmits the maximum of useful heat to the furnace surfaces.
- 2 FLUID HEAT OIL BURNER. Remarkably quiet. Completely automatic. Amazingly trouble-free. Exceeds industry standards established by the government. "World's Economy Champion."
- **3 OBSERVATION PORT.** Very handy when adjusting fire at point of greatest efficiency.
- FURNACE OF HEAVY STEEL PLATES. To insure added years of service the metal is extra thick on the primary heating surfaces which are exposed to direct radiation from the flame.
- 5 EFFICIENT INSULATION prevents loss of heat through jacket, keeps outside surfaces cool.
- 6 NON-RUSTING HUMIDIFIER is mounted inside plenum chamber. Regulator automatically maintains the water in the Humidifier at a constant level.
- 7 COMBINATION FAN AND LIMIT CONTROL.

 In winter this keeps the furnace from over-heating and starts the blower when the bonnet temperature reaches the desired point. In summer it locks out the oil burner and makes it possible to secure air circulation all over the house.
- 8 CLEAN-OUT OPENING is sealed with gas-tight asbestos gasket.
- 9 FILTERS OF SPUN GLASS are made so that the spaces between the threads become smaller as the air passes through, thus scrubbing the air clean of dust, lint, etc.
- 10 QUIET BLOWER draws the return air through the filters where it is cleansed of foreign particles, forces it over the heating surfaces of the furnace, and circulates the warmed and moistened air throughout the home. Also provides summer circulation.



AIR CONDITIONER OF OUTSTANDING QUALITY CRACKS SMALL HOME MARKET WIDE OPEN

Why be high bidder on small-home jobs? There's no need to lose any of this profitable business. For Fluid Heat gives you a new Air Conditioner, sized and priced to put you ahead of competition. Designed and built entirely by Fluid Heat engineers, this 80,000 B.T.U. unit hits a new low price for a quality air conditioner.

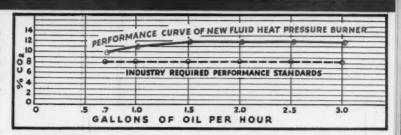
Here's the first air conditioner ever equipped with a high pressure burner that burns 7/10 G.P.H. efficiently. An air conditioner that's smartly styled, appealing to the eye. Any prospect can see at a glance that it's a quality unit from top to bottom.

Complete in every detail, the Fluid Heat FHA offers features found in no other similarly priced air conditioner. Combination fan and limit control switch, rust-proof humidifier, draft regulator, built-in combustion chamber, ample filter area, quiet blower, famous Fluid Heat pressure burner, "the World's Economy Champion." Its uniform air flow eliminates hot spots in exchanger, utilizes all available heating surfaces. Exchangers of copper-bearing steel assure longer life and freedom from corrosion. Finish is baked by a new infra-red method. Design is gas-tight. Exchanger is welded into one piece and clean-out covers are held gas-tight by asbestos gaskets.

It's designed for top efficiency and yet its price is right because production costs are kept to a minimum. We buy steel in carlots from a mill just five miles from our own large, modern plant. The steel is delivered to our own siding, unloaded by electric cranes, carried by electric platform trucks direct to the most modern, fast-working metal forming machines. Line methods are used in production. Thus, expensive handling and shipping costs are eliminated.

Read on this page about the unparalleled features of the new Fluid Heat FHA Air Conditioner. Get more information about it. Let us send you the complete story of this remarkable new unit and the entire Fluid Heat line of Air Conditioners. Mail the coupon below—right now—for full details.

10



EXCEEDS INDUSTRY STANDARDS

The chart above shows how the new Anchor Fluid Heat Pressure Burner used in this Air Conditioner exceeds industry standards. It's efficiency PLUS—performs with a practically flat curve of combustion efficiency. It's the first Pressure Burner to efficiently burn .7 to 3 G.P.H.

An Air Conditioner to Solve Every Home Heating Problem



Larger Air Conditioner also available with bonnet ratings of 120,000, 170,000 and 215,000 B.T.U.'s.

Fluid Heat Division



This 80,000 B.T.U. unit made with oil burner mounted externally or with enclosed oil burner.

MAIL COUPON TODAY!

fluid heat-

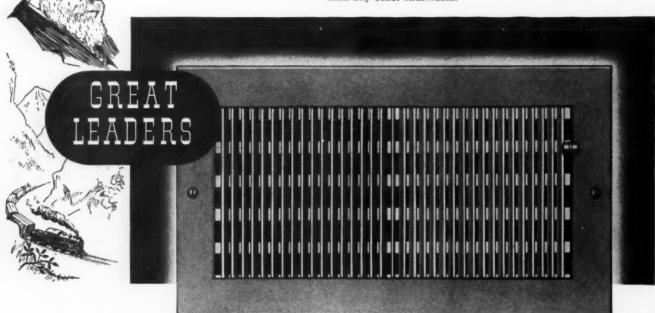
"World's Economy Champion"
A PRODUCT OF THE ANCHOR POST FENCE COMPANY,
BALTIMORE, NO., ESTABLISHED 1892

Anchor Post Fence Co.
6721 Eastern Avenue, Baltimore, Md.
Gentlemen:
I'd like complete information at once on your New Fluid Heat Air Conditioner.

City_____State

JAMES J. HILL Made Railroading More Efficient

The name of James J. Hill leads all the rest as a great organizer and manager of railroads. He probably contributed more to the development of our great Northwest than any other individual.



Independent "Fabrikated" Has Made Air Conditioning More Efficient

• The invention of "Fabrikated" registers marked a new era in the distribution of air flows. It is not too much to say that the efficiency of today's warm air heating and air conditioning is dependent on the varied and definite deflection of air flows made possible by "Fabrikated" construction. Whether for air conditioning or gravity installations, Independent "Fabrikated" Registers, Grilles and Cold Air Faces lead in strength, rigidity, appearance, and large open area.

Send for catalogs

THE INDEPENDENT REGISTER CO.

3747 E. 93rd STREET

CLEVELAND, OHIO



INDEPENDENT Fabrikated (REG. U.S. PATRICE)

AND AIR CONDITIONING REGISTERS AND GRILLES

BALANCE

PRICE * APPEARANCE QUALITY * SERVICE Comfortzone



• Mr. Dealer: COMFORTZONE presents to the home owner all the essentials of fine furnaces and their true relationship—namely price, appearance, quality, and service. Write for prices and specifications today.



MICHIGAN TANK & FURNACE CORP.

14101 PRAIRIE DETROIT, MICH.



That's what you need in a humidifier water control—that's what this advanced design gives—



HUMIDIFIER water control that just barely cracks open and seeps or dribbles when the float drops, can't stay on the job very long under the conditions of heat, mud and foreign matter that such a valve encounters.

But why tell you this? You have probably seen plenty of proof of it-valves stuck open, flooding the pan or basement floor - valves plugged up with lime or dirt, killing the whole humidifying effect.

The new McDonnell Humidifier Water Control, pictured above, gets away from this fault of former controls. Its foremost feature is an ingenious camand-roller valve action that makes the

valve snap from tight closed to wide open in a quarter of an inch of water level movement.

There is no seeping or dribbling whatever. The valve opens wide when water is needed, flushing out the orifice and everything on it. It closes with the same snap — absolutely tight against water pressures up to 150 pounds.

That's the basic feature, but it's only one of many. All important parts are located above the water level - valve cone and seat are practically indestructible - float height, and therefore water level, are readily adjusted. But despite its higher quality, this new control is attractively priced.

WRITE for new circular It shows types for every requirement — describes proving tests — explains how we have built a finer control at a moderate price.

MCDONNELL & MILLER, 1318 WRIGLEY BLDG., CHICAGO, ILL.



MCDONNELL HUMIDIFIER WATER CONTROLS BOILER WATER FEEDERS LOW WATER CUT-OFFS





Continually Expanding

to Fulfill Today's Demands

• The Moncrief line has been enlarged amazingly of late years so that it now includes 227 types and sizes. This gives the Moncrief dealer the widest possible selection of specialized units to fill all demands in his community.



SERIES "C" CAST

You will profit most with the complete Moncrief line. It gives you ample profit margin. The units are assembled for quick, easy installing-quality-built to give the home owner enduring satisfaction.

Get acquainted with the profit-making possibilities of the Moncrief Proposition. Write today for particulars.

The Henry Furnace & Foundry Co. 3473 East 49th St. · Cleveland, Ohio



ARISTOCRAT OIL-FIRED AIR CONDITIONER

WINTER AIR CONDITIONERS Aristocrat Oil-Fired Special Oil-Fired Utility "55" Oil-Fired Aristocrat Coal-Fired with cast heating unit Aristocrat Coal-Fired with steel heating unit Series "700" Stoker-Fired with steel heating unit Series EE Coal-Fired

with steel heating unit Moncrief Square-Cased with Blower-Filter Unit cast and steel heating units Aristocrat Gas-Fired Special Gas-Fired

SEE ALL THAT MONCRIEF OFFERS YOU-

"BAC" Gas-Fired

WARM AIR FURNACES De Luxe Long Life cast and steel heating units Standard Long Life

cast and steel heating units Series "C"-Cast Series "5"-Steel Series "D"-Steel Series "E"-Steel In square cased ename! finished and standard galvanized casings

Series "F" Cast Series "GG" Gravity Gas Furnaces

Moncrief Blower-Filter Units Moncrief Automatic Humidifiers A Complete Line of Warm Air Heating and Air Conditioning Pipe and Fittings



Blower-Filter



New! MONCRIEF DE LUXE LONG LIFE with 20-year Guarantee



Moncrief Supplies Everything Used on a Warm Air Heating and Air Conditioning Job

Comfortable Users Said: Don't Change the Penn Temtrol

But Installers Suggested the Time Saving Improvements in this New Thermostat

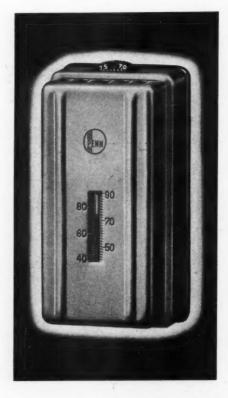
SIX years ago, Temtrol, Penn's heat anticipating or internally heat actuated thermostat, was announced. It was the first practical thermostat of its kind-first to give "fraction-of-a-degree" temperature control on all types of heating systems-steam, hot water or warm air.

Such accurate temperature control then was almost unbelievable. Now, it is an accepted fact. Today, thousands upon thousands of home owners are better satisfied with their automatic heating installations because they are controlled by Temtrol. Comfortable users and laboratory workers alike have said for years, "How can anyone make a better thermostat?"

The truth of the matter is, neither Penn nor any other thermostat maker has been able to improve on the temperature controlling, constant comfort qualities of Temtrol. But from those men "on the firing line," installing and servicing automatic heating equipment, have come suggestions for refinements in design and construction to make the installer's work easier . . . to save installation time.

New 870 Series Temtrols Offer these Refinements

Here, Mr. Installation Man, is the new Penn Temtrol, built to your specifications. A modern, easily installed, non-breakable metal cover. A one-piece molded bakelite base with quick three-point mounting . . . reduces the problem of base distortion. Combination wire stop and terminal barriers molded into back of base to speed up wiring . . . prevent stray wire strands from causing a future service call. A simple, plainly marked differential adjuster-Cycle-

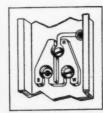


ator - to provide accurate control for all systems. Specify Temtrol. Install Temtrol. See these new advantages for yourself.

Day-Nite Control, Too

And, the new 870 Series Temtrols, offer the simple, two-wire automatic Day-Nite Control with Tem-Clock that has proved so popular with manufacturers, dealers and installers. You can still stock Standard Temtrols, keep a few inexpensive Day-Nite heaters and Tem-Clocks, and provide your customers with fully automatic, all-electric Day-Nite Control "on order" with a limited inventory. Easily installed, and the customer can have Tem-Clock in any room he chooses, regardless of where the thermostat is located. Write for complete informa-tion on the new Penn Temtrols. Penn Electric Switch Co., Goshen,

Indiana. In Canada: Powerlite Devices, Ltd., Penn Electric Switch Division, Toronto, Ont. Export: 100 Varick St., New York City. Representatives and distributors in all principal cities.



Temtrol temperature controlling qualities couldn't be improved, but the installer's work has been made easier in the new 870 Series Temtrols. Here is a partial back view of the molded bakelite base, showing terminals recessed into the base, which forms both wire stops and terminal barriers to save wiring time and prevent stray strands of wire from contacting each other.

This entirely new snapacting magnet contact structure offers these advantages: Alnico magnet, the strongest, most permanent magnet yet devised. Contacts which both open and close with armature moving at full speed. Contacts and flexible contact leaf well protected against accidental damage.



Cycle-ator, a convenient, plainly marked differential adjuster, provides a full range of adjustment to meet all installation conditions . . . for all types of heating systems — steam, gravity hot water, forced hot water, gravity warm air, forced warm air—gas, oil or coal fired. Assures maximum comfort with minimum fuel consumption.





Day-Nite Heaters for 870 Series Day-Nite Heaters for 5.0 Series Temtrols are available for 6°, 9° or 15° night set-back of temperature. Easily installed in the field on Standard Temtrol. Day-Nite Temtrols regularly supplied with 9° set-back heater unless otherwise specified.



Comfort Zone Control Means Satisfied Customers

The occupied half of the home—the Four Foot Zone—is the Comfort Zone, with the heating plant controlled by Temtrol, mounted at table level. Eliminates "Cold 70"... gets rid of cold floor problems... automatically compensates for outside temperature changes with a simple, standard control system.

More information on what Penn Controls will do for you - One of a Series.

Penn-Built Controls for Many Applications Thermostats, Bonnet Controls,
Ductstats, Fire Protection Controls, Water Temperature Controls, Boiler Pressure Controls,
Boiler Water Level Controls,
Humidistats, Stack Switches,
Stoker Timer Relays, Solenoid

Gas Valves, General Purpose Re-lays, Solenoid Refrigerant and Water Valves, Refrigeration Pres-sure and Temperature Controls, Vater Valves, Pump Controls, Air Compressor Controls, Air Volume Controls, Line Starters.



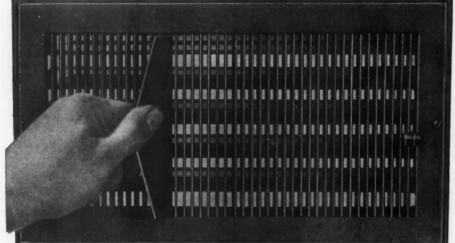


New 4-WAY FLOW FLEX-BAR

Style 256

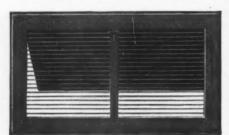
Your reputation as a heating contractor depends on more than ability to solve heating problems. Today's home owner expects and values your guidance in making his home attractive as well as livable.

Style 256 Flex-Bar gives you full and exact control of heat flow in all four directions plus a modern dignified beauty that fits in with modern home furnishings.



This new development furnishes complete adjustment of air flow to any degree of Up or Down Flow by setting the back multiple valves with the knob at the right. Side Flow is directed by setting the Flex-Bars of the Grille with the Handy Wrench as illustrated. Style 256 is recommended for Air-Flow Setting at the time of installation but may be reset any reasonable number of times.

Where Price Is Important



Style 153 U. S. Air-Conditioning Register

Install Style 153 U. S. Air-Conditioning Registers with FAMOUS U. S. INSET PANELS.

(where and if Side-Flow is necessary)
QUALITY LOW-COST DIRECTIONALFLOW for Competitive jobs—Perfectly
and Economically handled by Style 153
U. S. Air-Conditioning Registers with
Inset Panels. U. S. Inset Panels quickly
snap into place for Left, Right, or Left
and Right Directional Flows. See Catalog 27 for full details.



U. S. Also Has A Complete Line of Gravity Registers and Grilles



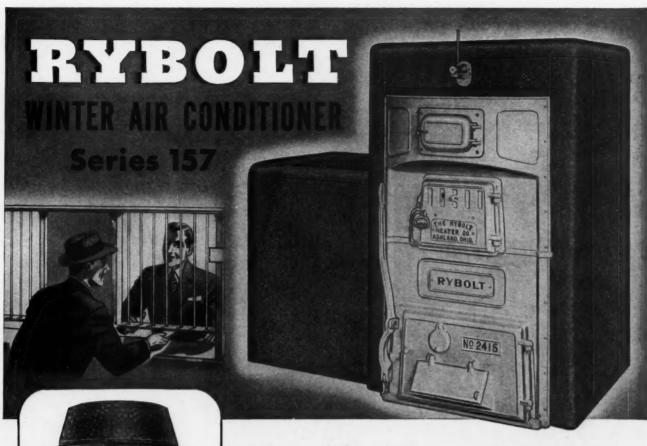
Send for Summer Price Schedules

NITED STATES REGISTER CO.

BATTLE CREEK, MICHIGAN

MINNEAPOLIS . KANSAS CITY . ALBANY . SAN FRANCISCO . NEW YORK, N. Y

CANADIAN MANUFACTURING DISTRIBUTORS — Canada Register & Grille Co., Ltd., Toronto, Ontario



Rybolt Cast Iron Furnace...Series 15

RYBOLT Series 15 is a quality furnace throughout, attractive in appearance, designed and built for utmost heating efficiency and economy. Extra large duplex ball bearing grates, waist high shaking lever, slip-on front casting, one-piece radiator, effective smoke consumer and extra weight castings are special features.

A unit you can bank on

● You can bank on the dependability of this RYBOLT Winter Air Conditioner and the lasting satisfaction it will give your customer.

You also can bank the extra profits that come from steady sales which establish your leadership in the residential heating field. One RYBOLT sells another because your customers are proud to recommend this quality unit to their friends.

RYBOLT Series 157 has for its heating element the well known RYBOLT Series 15 Cast Iron furnace with its famous capacity for dependable performance. Fully equipped with modern features of the most advanced type this unit provides automatic winter air conditioning at its best.

Blower cabinet may be placed on either side of the unit to permit easy installation. Baked enamel finished cabinet with aluminum finished front. 4 sizes.

WRITE FOR set of folders covering the complete Rybolt line of Furnaces and Winter Air Conditioners.



THE RYBOLT HEATER COMPANY
615 MILLER STREET - ASHLAND, OHIO

ANOTHER HEATING SYSTEM GETS Double protection AGAINST RUST IT'S easy to double or triple the rust resistance of duct work at very little

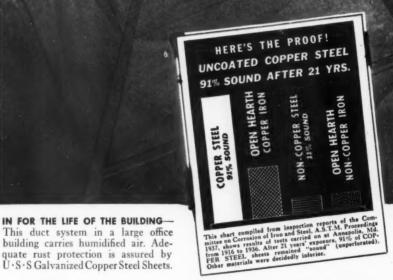
T'S easy to double or triple the rust resistance of duct work at very little cost—just build with U·S·S Galvanized Copper Steel. In numerous endurance tests, this low-cost steel has lasted 2 to 3 times as long as plain steel when exposed to atmospheric corrosion. (See chart)

The almost negligible extra cost of U·S·S Copper Steel is shown by these figures taken from the bids on an \$8000 home. The heating system cost \$550.00, but the added cost of copper steel in the ducts was only 75 cents—a figure so small that it made little difference in the contract price of the house. The same ratio of costs

Over a period of time the increased rust resistance of U·S·S Copper Steel makes it the most economical metal to use for humidified air heating systems. Corrosion is a problem here and ducts need the double protection of a rust-resisting base metal in addition to the galvanized coating.

holds true for larger buildings.

U·S·S Copper Steel in easy working black or galvanized sheets is ready for quick deliveries in all parts of the country. Specify it for long-lasting duct work.





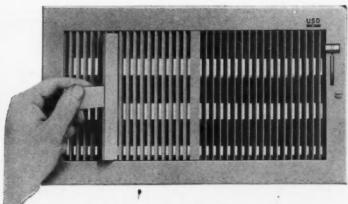
GALVANIZED COPPER STEEL SHEETS

CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago COLUMBIA STEEL COMPANY, San Francisco TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham

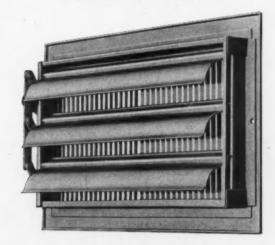
Scully Steel Products Company, Chicago, Warehouse Distributors
United States Steel Export Company, New York

UNITED STATES STEEL





Open area approximately 80%



With this Auer Airo-Flex "4000" Register, air flow may be directed at any angle upward, level, or as much as $22\frac{1}{2}^{\circ}$ downward. The Multi-louvre Back Blade, operated by lever, regulates this up-and-down flow. Indicator on face shows position of louvre.

For sideway direction, grille bars are so constructed as to permit necessary adjustment at time of installation for any combination or single flow—straight, right or left. Adjusting tool furnished with register. When delivered, registers have grille bars set half to right and half to left.

The Airo-Flex design is also made in the "7000" Series, with horizontal adjustable grille bars and single blade louvre.

These are highly practical registers, easy to install and to adjust. See them at your supply house. Complete Auer Register Book 40, describing all air conditioning and gravity registers, sent on request.

THE AUER REGISTER COMPANY, 3608 PAYNE AVENUE, CLEVELAND, OHIO

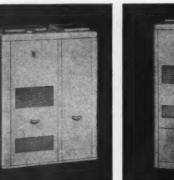
AUER REGISTERS

& GRILLES For Air Conditioning and Gravity

COLL Quickly! Easily! Profitably!



SUNDEAM SERIES HI — Modern, efficient, good looking. Has rugged cast iron heating element. Designed with low over-all height for low basement applications. Available in four sizes with capacities ranging from 80,000 to 150,000 B.T.U. input per hour.



SUNBEAM SERIES SI — Combines high quality and low cost. Beautiful, efficient, economical in operation. Cabinet encloses all controls and is of low over-all height. Steel heating element. Available in 5 sizes from 70,000 to 150,000 B.T.U. input per hour.



sunbram series H — A low-cost cast iron Air Conditioner. Series H has return air inlet at rear. In 4 sizes from 75,000 to 150,000 B.T.U. input per hour. Series HV has return air inlet through bottom. In 2 sizes—55,000 and 75,000 B.T.U. input per hour.



sunseam series su—A spacesaving, money-saving Air Conditioner. Designed for homes without basement or where basement space is limited. Heating element is constructed of durable steel. Five sizes from 70,000 to 150,000 B.T.U. input per hour.

4 NEW

SUNDIFICAM Gas Fired AIR CONDITIONERS

TURN THE Summertime into Sales-Time — right now! Sell the four fine GAS-FIRED Sunbeam Air Conditioners — specifically designed to bring you business in small and average size homes.

The HL and H Units have cast iron heating elements—never before incorporated in Air Conditioners of comparable cost. The SL and SU offer all the advantages of steel construction at its best!

All four Sunbeam Units are soundly engineered, precision built — designed to provide years of satisfactory service and economy. To stimulate extra modernization jobs use our Summer Finance Plan: No down payment — no payments till October 15th — up to 3 years to pay on easy monthly terms — you get cash on installation!

Write today for the name of the nearest Sunbeam Jobber.



Visit our building and exhibit at the New York World's Fair. Ask for Mr. Frank Stubbs, the American. "Standard" Exhibit Manager.

AMERICAN & Standard RADIATOR & Sanitary

New York CORPORATION Pittsburgh

Copyright 1940, American Radiator & Standard Sanitary Corporation

Who knows WHAT TOMORROW MAY BRING? MAY BRING?

There is no denying that the future will have its uncertainties, but hasn't this been just as true of the past? No one in the sheet metal industry, for example, will say that the '30s were easy years. Yet, those who kept trying and gave honest value emerged the better for them.

Yes, the '40s have brought new problems, but the answer to them is the same as it always has been. Grasp today's opportunities, keep up with the many new developments in materials and methods, be ready for those which tomorrow is sure to bring. That is our job as well as yours.

To do our part, OSBORN is maintaining one of the most complete stocks in its long history. Because of this, we are not only in position to serve you with information and prompt deliveries on your needs of today, but also to furnish any of the scores of items which your tomorrow's may require.

Are you making full use of OSBORN service? We invite you to do so.



Blowers

Canvas

Conductor Pipe galv. steel.

Armco iron. copper,

Controls

automatic heating

Eaves Trough see conductor pipe

Fans - ventilator

Furnace Pipe and

Fittings

Gutter, O. G. see conductor pipe

Hangers

eaves trough

and gutter

Hooks conductor pipe

and flashing

Humidifiers

Machinery hand, foot and power

Nails

Paints

tinner's red and house paints

asbestos, red rosin, building. asbestos mill board

Registers-warm air

Ridge Roll

Roofing

asphalt in rolls and shingles, felts.

asbestos siding, roofers supplies coatings

Roofing and Siding galv. steel, Armco iron copper, terne

Roofing Ternes 40 lb. and 25 lb.

in IX and IC 15 lb. and 8 lb. IC roll tin IX and IC

Sheets

aluminum, steel, iron, copper, zinc, stainless, long terne, enameline

Sheets (Corrugated)

THE J. M. & L. A.

Sheets (Perforated)

Sheets (Plated)

chrome and nickel plated zinc. copper, tin and

Solder and Fluxes

charcoal, cokes. imported dairy. roofing ternes

Tools

every kind used in sheet metal

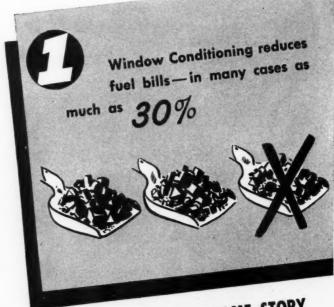
Ventilators roof and fan

YEARS DEPENDABLE SOURCE OF SUPPLY FOR 81

HERE'S YOUR OPPORTUNITY TO SELL MORE AUTOMATIC HEAT

Another L·O·F Window Conditioning Campaign — Bigger, Better, More Forceful Than Ever — Will Create Thousands of Prospects For Your Equipment — Right in Your Community.

- This year the L·O·F Window Conditioning Campaign will stress the benefits of storm windows and attic insulation. It will be more dramatic, more far reaching than ever before. Here's the program:
 - DRAMATIC, CONVINCING AD-VERTISEMENTS IN THESE LEAD-ING NATIONAL PUBLICATIONS —Saturday Evening Post, American Home, Better Homes & Gardens, Parents' Magazine and Farm Journal.
 - 2. THE SALES PUNCH OF A 66-STATION, COAST-TO-COAST RADIO PROGRAM.
 - 3. The widespread distribution of attractive interesting booklets that tell the complete story of Window Conditioning and Attic Insulation.



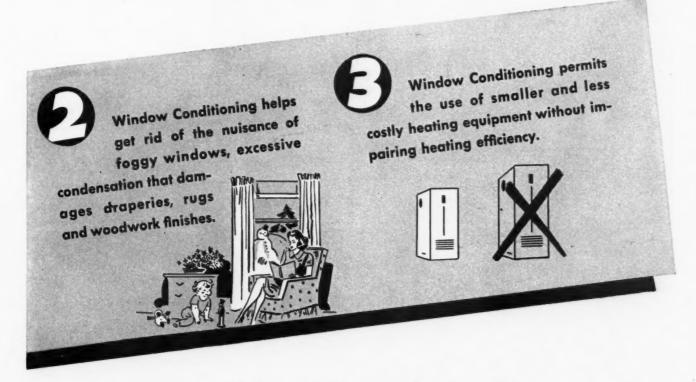
F. H. A. TELLS THE SAME STORY
In a dramatic technicolor motion picture
"Design for Happiness", just released

by F.H.A., this Government agency reterms our story of the economy and comfort of Storm Sash and Attic Insulation. According to F.H.A. estimates, this picture will appear in over 5,000 theaters before an audience of 15,000,000. Be sure you see it when it comes to your local theater; tell others to see it, too.

LIBBEY-OWENS-FORD

TO CASH IN... AND AIR-CONDITIONING EQUIPMENT

And this program that is going to impress millions of people is going to mean a lot to you. It's going to create a lot of new prospects for automatic heat and air-conditioning equipment. It's going to lessen sales resistance. Here's why. Because the operating cost of automatic heating equipment is reduced—the effectiveness of winter air-conditioning equipment is increased—by Window Conditioning.



To bring your equipment within the reach of more and more people, talk Window Conditioning. It will be to your advantage to stress its merits in your contacts with building contractors, home owners and prospective home builders. And look for the houses where storm windows are being put up. You'll find a lot of prospects inside.

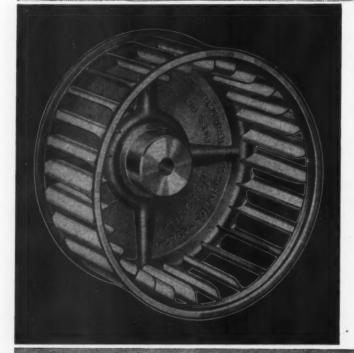
Libbey Owens Ford Glass Company, Toledo, Ohio



QUALITY GLASS

NO RIVETS - - NO WELDS - - FOUR-PIECE CONSTRUCTION

A DOWER Wheels TRADE MARK REGISTERED Blower Wheels

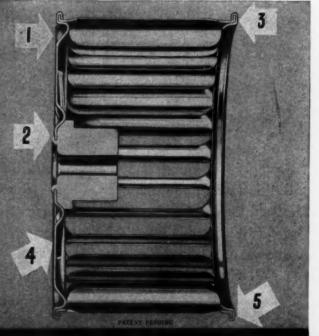


... A sturdier

more efficient light weight wheel at the LOWEST PRICES EVER OFFERED

Here is EXACTLY what we believe you want... a much better blower wheel at a much lower price. In this new and unique design, Torrington engineers have produced a light weight, smooth running wheel of extreme rigidity and high efficiency. Several sizes already available, the new Torrington Airotor Blower Wheel will soon be manufactured in ALL sizes . . . both single and double widths. Write for prices and complete specifications.

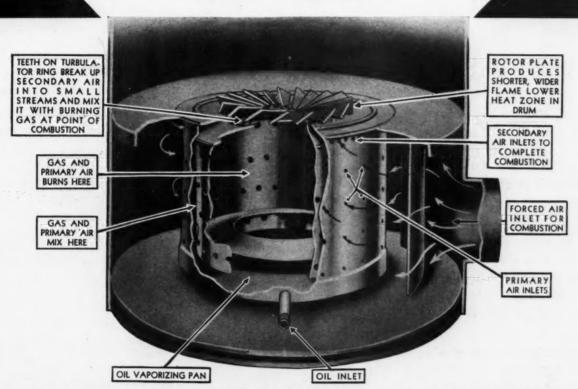
- Concentric rib serving as backing for blade strip formed at same time as hub socket insures maximum degree of concentricity.
- Hub fitted and fastened securely to a cone shaped socket to insure concentricity and rigidity.
- Deep formed concentric rib which insures trueness of wheel. This rib bears against the end of blades to minimize cantilever blade deflection.
- Deep formed radial ribs blending into hub socket, thereby stiffening back of wheel and resisting deflection by thrust against hub.
- Three thicknesses of metal making for a maximum strength.
- 6 Minimum number of parts (4 including hub) assembled without rivets or welds.



THE TORRINGTON MANUFACTURING COMPANY

Torrington-Connecticut

New MONOGRAM Vaporizing Oil Burner Burns with a Clean-Quiet-Gas Flame Made From Oil



Used Only in the New MONOGRAM Oil Burning Furnaces

Model No. 101. Automatic Forced Warm Unit for Small FHA Homes.

Since an oil burning furnace is only as good as its burner, let's talk about this new "vaporizing" type burner, created by MONOGRAM.

The MONOGRAM burner is not to be confused with the so-called pot burner because instead of burning from a pool of oil in the bottom, it vaporizes the oil quicker, more completely and these oil vapors, ing from a pool of oil in the bottom, it vaporizes the oil quicker, more completely and these oil vapors, being heavier than air, fill the bottom of the burner. Notice that MONOGRAM has two perforated shells—the space between these two shells is sealed off at the top by the Turbulator ring. This is what happens—air enters the holes in the outside shell—passes through the space between the two shells and enters the burner through the holes in the inside shell. This causes a vacuum between the shells which pulls the gas up from the bottom and mixes it with primary air before it burns—only MONOGRAM has the patented air mixing feature.

Secondary air is admitted through a row of holes at the top between the Turbulator ring and the main top ring of the burner. Teeth in the Turbulator ring split up this secondary air into small streams and thoroughly mix it at the point of combustion. The rotor plate, at top, creates a shorter, wider, more intense flame, which makes a double baffle in heating drum possible, causing a lower heating zone and greatly increasing the operating efficiency.

The MONOGRAM burner has no moving parts and operates higher than 80% efficient, burning a clean, quiet gas flame, made from oil.

Made in any size you may need—a special model for those low cost FHA houses without basements—a booster gravity unit in two sizes for replacing present hand-fired warm air furnaces quickly, easily, and also a full forced winter air conditioning unit in two sizes. Also a specially designed model for filling stations.

Write for Complete Catalog and Prices

Model 150. Winter Air Conditioner.



THE QUINCY STOVE MFG. COMPANY QUINCY - - - ILLINOIS



"No ned ink on our PROFIT STATEMENT"

Richard Mansfield of James Mansfield and Sons Co., Chicago, {at left in photo with his father and brother, Clarence} one of the largest firms in the Midwest specializing in sheet metal, has a lot of faith in Toncan Iron because of its effect on his balance sheet. During the Company's Golden Anniversary year he makes these comments—

• "Our work as roofers and sheet metal contractors involves both residential and industrial jobs. For every type of exterior or interior application where sheet metal is suitable, we use Toncan* Iron. Here's why:

"Work in the shop moves along quickly, because we have no trouble with hard spots in the sheets, nor is there any flaking. In addition, in all the years we have used Toncan Iron we have never had a single complaint on the metal.

"But most important to all of us are cost figures. Here is a 'spec' right here that involves a bid of \$577.00 based on using a popular non-ferrous material—which is supposed to last a lifetime—yet for \$315.00, indicating a \$262.00 saving, the buyer can have Toncan Iron, which we guarantee for twenty years. Ordinary steel for the same job would cost only five dollars less than the Toncan, yet would not survive nearly as many years. I can't see how anyone can justify anything but Toncan Iron.

"And I know from experience what I am talking about on service life. Actually, the supposed high-priced 'lifetime' material has an average life of only twenty-five to thirty years in this territory, yet I can show you scores of our Toncan Iron jobs that have withstood twenty or more years. Dad put Toncan gutters and spouts on his own home eighteen years ago, and today they are in excellent condition. They probably will last at least another ten years.

"Costs and profits are important to every man in our trade. That's why Dad founded this business fifty years ago on the slogan 'not how cheaply I can do it, but how well.' And the fact that Dad established such a fine record under this policy makes Clarence and me sentimental to feel that the reputation of this shop is at stake every time we accept a job. The result is that we can't afford to take chances. That is one big reason why long

ago we standardized on Toncan Iron. It has been many a year since we have had any kind of sheet metal in this shop except Toncan Iron.

"Is our policy sound? Well, it's been a long time since we've seen red ink on our profit and loss statement."

Booklet 186—"The Path to Sheet Metal Permanence"—

tells the story of Toncan Iron. Ask for a copy—writing Republic Steel Corporation, General Offices, Cleveland, Ohio.



REPUBLIC TONCAN IRON

An alloy of refined open-hearth iron, copper and molybdenum

—that grows old slowly

BERGER MANUFACTURING DIVISION NILES STEEL PRODUCTS DIVISION STEEL AND TUBES DIVISION UNION DRAWN STEEL DIVISION TRUSCON STEEL COMPANY Vol. 109

*Reg. U. S. Pat

IVISION

VISION VISION ANY

American ERTISAN

No.7

Is The "Low Cost House" Feasible?

As announced several times previously, this issue contains a special survey of central type, warm air heating systems in low cost houses. During the gathering and preparation of the material a number of things became apparent.

Our original intention was to limit the discussion to central heating systems installed in houses costing not more than \$2,500. In other words, to houses constructed under Title 1, Class 3. Very quickly we found that in most parts of the country the house costing \$2,500 or less is still "something to talk about" and contractors all over the country reported — "no \$2,500 houses in our locality."

As a result, most of the houses shown in the survey cost to build around \$3,000 to \$4,000.

This fact may be important. Perhaps our industry has been worrying unnecessarily over a type and size of house which never will be a factor in home building. We don't profess to know; we only speculate.

Why isn't the \$2,500 house as numerous as we thought? Letters from readers indicate that the house costing \$2,500 necessitates elimination of several good old American customs we so far do not seem willing to relinquish.

First of all the \$2,500 house can't be very large. Nor contain very many rooms. Some rooms must do double or triple duty. For instance, dining rooms are practically always omitted. The kitchen or living room must serve for eating. Maybe a dining room is a non-essential, but the man with a family must dislike eating crowded around the kitchen table. And his wife probably dislikes the idea of "setting the table" in the living room and "un-setting the same table" at every meal.

A house costing \$2,500 can have no basement in most areas. Perhaps the average basement is only a "catch-all" for discarded odds and ends, but with the man of the house looking for a place in which to tinker; with family washing still needing drying in bad weather; with recreation or rumpus rooms on the up-swing, there does seem to be use for a basement. If we eliminate the basement we must make available space and products to replace work benches, clothes lines,

play rooms. We haven't done this yet.

Where union labor builds houses, or where building trades wage rates exceed \$1.25 per hour, even more drastic elimination must be practiced. Numerous cities report houses offered for \$2,500 to \$4,000 where the buyer must do his own decorating, must build rooms in the attic, must even finish his plumbing and electric wiring or have them done after he moves in.

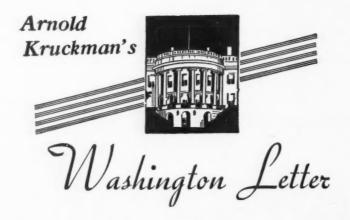
And highly important to our industry is the fact that in at least half the nation, winter heating is a major item. In one-half the country a family simply cannot get by with half-hearted, untried, experimental heating. In half the country we need heat and lots of it during one-half to three-fourths of the year. Half the rooms unheated, or half of the major rooms poorly heated is asking much of the average family.

And right along this line, we, as the industry with most research behind us, should remember that the average family today expects much better heating than the family one or two generations back. We have taught the home owner to expect uniform temperatures through his house; plenty of heat no matter how cold; and we have publicized well the benefits of winter air conditioning.

This better heating costs money. Systems require the expenditure of definite amounts of the building dollar. To pay less is to get less.

We feel that this Low Cost House Heating Section is definite proof of accomplishment by our industry. The plans indicate that the heating man has met fairly and successfully the builder's demand for heating at lower cost. It is our industry's contribution to lower cost houses because the reductions in cost have been obtained from smaller contractors' profits, by ingenious scheming to reduce material and labor required, by adoption of furnaces which were not available a short time ago.

We do not know whether or not the \$2,500 is a possibility. But we do feel that in most parts of the country, with labor as it is—drastic changes in building which we have so far not even visualized must be introduced before the really low cost house is feasible.



RECENT FHA emphasis on low-cost home-building has revealed the little known fact that FHA's specifications require a chimney but do not literally require a heating system. Of course, it is obvious that most homes must have some form of heating, but in the Southern areas householders consider heat a negligible requirement and depend almost wholly upon such space heaters as they may pick up at the corner hardware store for a few dollars. This type of equipment naturally does not fall within the category of the installations upon which the FHA will guarantee a mortgage, and it is from this aspect of the situation that the FHA is led to omit the heating system as an absolute requisite of an undertaking to build a home.

Too Many Stoves

It may interest many readers of The American Artisan also to learn that in most of the very lowcost homes the FHA now is insuring, the heating system is the old-fashioned stove in the living-kitchen-dining room. The point became particularly patent in the dwellings that have been erected and are in process of erection in a section of Baltimore. These four-five room homes, with two bedrooms, hall-living room, kitchen-dining-living room, are warmed by a heater in the kitchen-dining-living room. The stove is part of the equipment that comes with the house.

The FHA publicity release smoothly covers the subject by stating "standard equipment includes complete bathroom fixtures, kitchen sink, and an oil-burning, hot-air unit in the living room. An underfloor heating unit may be substituted for \$40 additional." The underfloor heating unit is, of course, a ductless floor furnace. The off-the-record information here is that, as an alternative, the owner may have a coal stove in the living room or a gas or coal furnace under the floor.

It may be of interest that these "cheap" houses in Baltimore are prefabricated structures offered in four different floor plans. They look similar, although the exteriors are painted differently. They are placed on lots that average 50 by 80 feet. There are 130 dwellings in the original group. The contractor, a New Yorker who normally devotes his energies to heavy construction, now is engaged in building 3,000 more of these homes in the same area.

Standardization Cuts Cost

Originally it was planned to sell houses of variable design for sums ranging from \$2,500 to \$3,000. But it was found that by adhering to a basic plan the costs could be made identical and, since the people of Baltimore by habit and tradition are inclined to accept uniformity in dwelling styles, it was easy to impose the rigid pattern. The houses are sold for \$2,750 with the land. No extras of any kind are permitted except the underfloor heating unit. FHA-insured financing is negotiated by special arrangements through one Baltimore bank and almost all of the purchasers are skilled mechanics, in Baltimore industrial plants, with an average income of \$1,600 a year.

FHA low-cost housing plans do not have the enthusiastic approval of all FHA officials. Many feel this line-production fervor is a temporary phase to speed up building, and that neither now nor in the future is it possible to produce homes with permanently sound equipment for the under-\$3,000 price. Technicians particularly feel that heating plants should not be scaled down too cheaply.

FHA's Own Research

Robert Thulman is the heating and plumbing specialist of the FHA and he has done much to secure a clear definition of what constitutes a well-heated house. Together with other Government specialists he has been conducting experiments at the Bureau of Standards where they have discovered some amazing facts.

For instance, they found that from floor to ceiling, in some rooms, there sometimes is an average difference of from 40% to 50% and that often the temperature difference is as much as 70% five feet from the floor to the ceiling. It was discovered that the

temperature in the living room with the heating unit might be 90 degrees, while four feet away in the bedroom it was under 65.

6% For Heating?-No

Howard Vermilya, Director of the Technical Division of the FHA, and Mr. Thulman sharply insist that the FHA absolutely does not countenance, directly or indirectly, any regulation of the prices of heating equipment used in homes built with FHA-insured funds. They emphasize that this policy is definite and absolute and that it is known to all the FHA officials in regional or local offices.

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They have heard that officials in some local FHA offices designate a proportion of 5% or 6% of the cost of a structure as an allocation for heating equipment. They say formally if such arbitrary allocation is suggested it is made without authority of the FHA and is improper and invalid as a matter of policy and practice. It is their belief, if such allocations are suggested, that they may be inspired by officials who have no real knowledge of heating problems, who have general knowledge of building problems, and who are honestly striving to work out, on their own responsibility, some plan of distribution of funds for the benefit of the person who is building a home. Both Vermilya and Thulman would unquestionably be glad to know of any instance where they may be helpful in defining the FHA policy and standards for the benefit of the local contractor and the local FHA official.

Performance Not Price Demanded

Performance requirements control the selection of heating equipment in dwellings built with FHA-insured funds. The primary requirement is that the heater must provide 70 degrees of warmth inside when it is zero outside. The installation must, as usual, be made in conformity with the regulations of the National Board of Fire Underwriters and according to specifications provided as guides by the National Warm Air Heating and Air Conditioning Association. All FHA officials here declare categorically there are no specifications defining the kind, type, make, or price of a heating plant that may be installed in an FHA structure. They point out that the problems are as varied as the regions, the geography and the climate of the United States and its territories and possessions; and they say that a day does not pass on which they are not confronted with the inevitable offering of new kinds and types and inventions for use as heating equipment.

Their invariable reply, they say, is that it is the business of the person who pays for the structure to choose the equipment, subject to the performance requirements. Apparently

(Continued on page 114)

RESIDENTIAL AIR CONDITIONING



DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

The answer to this question is determined by the requirements of the application. A cleaning efficiency higher than needed is an unnecessary expense, but if lower than

For this reason the American Air Filter Company offers a complete line of filters engineered to meet every air cleaning need. These range from the inexpensive throwaway types to the Electro-Matic which is the most efficient self-cleaning filter ever developed.

needed is a wasted investment.

AAF engineers will be glad to cooperate with you in solving your air cleaning problems. For preliminary information write for descriptive Bulletins.

THE
ELECTRO-MATIC
AIR CLEANER

combines electric procipitation as an integral part of an automatic self-cleaning air filter for highest cleaning efficiency. Collects smoke, soot and fine dust particles. Bulletin 250.



Cooling A Drug Store

By E. R. Ross

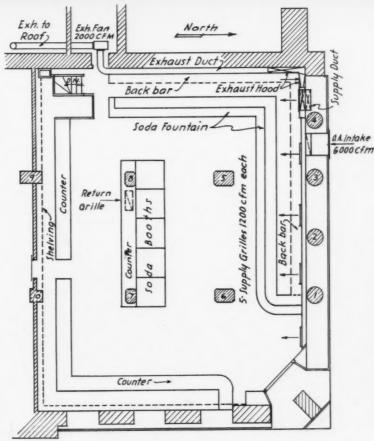
This is the second article by Mr. Ross. Article I, "Cooling a Small Dress Shop," appeared in the June issue. Each article is complete and sets up the calculations required for design and the analysis required for installation.

COOLING a drug store with a lunch counter and a row of so-called soda booths is one of the "ticklish" problems of commercial cooling since almost every possible means of heat gain is involved, including glass and wall exposures with direct sun light, cooking equipment, malted milk mixers, lights, people and then coupled with this is an unusual diversity factor.

Diversity factor in this sense might be called "usage" factor. In other words, at 1:00 P. M. when the transmission load is heavy, there is a luncheon crowd involving the use of all the cooking equipment and even those not lunching in the drug store usually stop in during their lunch hour to buy cigaretts, gum, aspirin, etc. Further, practically all drug stores have their case lighting and general lighting on at 1:00 P. M. making a real load to handle. At 2:30 P. M. there is practically no people load compared to a luncheon crowd and of course no cooking.

This just gives a few things to think about while driving to the location of the drug store to be cooled:

- Building description (as per plan Figs. 1 & 2)
- (a) Floor area $60\times47=2820$ sq. ft., ceiling height 12'0''.
- (b) Utilities of ample size are located in N.W. corner of basement.
- (c) Three-story building located on southwest corner of intersection. A city park across a wide drive to the east. Another three-story building across the street to the north. South and west walls are party walls to adjoining buildings. Walls 18-inch brick with 3/4-inch plaster on metal lath furred. Windows are all display windows as shown in plan (see Fig. 1). Basement under entire area used only as stock and locker rooms. Client's area in basement limited. See Fig. 2.
- (d) East exposure subject to full rays of sun in the morning.
- (e) Eight general lights at 500 watts each. One thousand watts of showcase lighting. Steam table



FIRST FLOOR PLAN

Plan of drug store. Note exposed windows, columns, lunch counters, cases, etc. Text explains how to take advantage of conditions to save cost.

with seven sq. ft. of area. Electrical appliances 5,120 watts total.

- (f) Occupancy: Employees 10: Customers 100.
- (g) Only a small portion of basement available for equipment. Client is remodeling the store to the extent that some new fixtures will be set along with a new soda fountain and the whole store including old fixtures will be painted. All fixtures are movable and the fixture arrangement is subject to change periodically.
- (h) This store occupies the corner storeroom of the street floor of the building and is leased. The tenant pays the gas and electric bills while the owner furnishes water.
- 2. The client is remodeling the store layout, but is not moving any walls or tearing out any plaster on ceiling or walls so that any of this type of work that has to be done with the installation will be directly charged to the cost of the air-conditioning system. Therefore, the duct distribution system should be installed with a minimum of cutting or patching as long as the efficiency is not reduced in doing so. The south wall and the east wall have wall cases that extend all the way up to the ceiling. The north and east walls have back-bars of the soda fountain. The back-bar with its superstructure is only eight feet (8') high and projects out from the wall, leaving a pocket above the superstructure which is a natural location for ductwork. In using these

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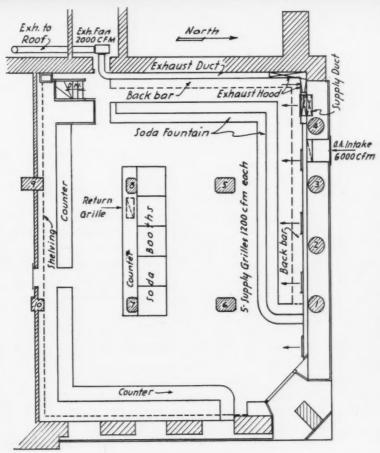
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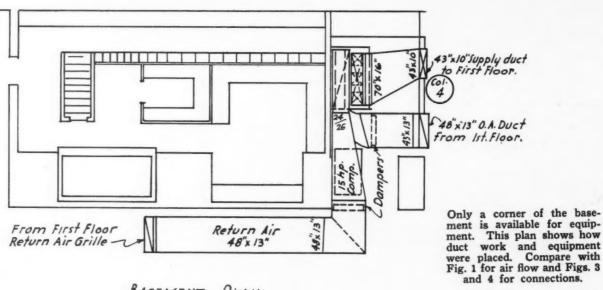


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BASEMENT PLAN

pockets, the cutting and patching is reduced to a minimum and it is unnecessary to have any projections in the room caused by ductwork such as there would be if the ducts were suspended from the ceiling down the middle of the store. The north and south dimension being the shorter throw; the supply duct is placed against the north wall blowing south.

This gives approximately a 45 foot throw so that the total quantity of 6,000 cfm. with this throw is taken into the grille catalogue and the number of grilles selected, keeping in mind the number of columns and their location so that the air will not be blowing against a column. Cold air blowing against a beam, column or any obstruction drops immediately and gives a so-called

FF1		***
TABLE	1—Design	TEMPERATURES

TEMPER- ATURE	DRY BULB	SENSIBLE HEAT PER LB.	WET LBUB	TOTAL HEAT PER LB.
Outside	95	22.96	75	37.81
Room	82	19.80	67	31.15
At Grille	67	16.18	60	26.18
Ent. Coil	85.4	20.63	69.3	32.95
Lv. Coil	65.5	15.81	59.7	25.98

TABLE 2-Internal Sensible Heat Gain

SENSIBLE H	HEAT TRANSMISSIO	N THROUGH	WALLS
------------	------------------	-----------	-------

Exposure	Sq. Ft. Area	COEFF. OF HT. TRANS.	TEMP. DIFF.	BTU. PER HR.
North Wall	310	.21	13	847
North Glass	496	1.13	13	5,600
East Wall	316	.21	13	863
East Glass	360	1.13	13	5,290
Partitions	1390	.21	10	2,920
Ceiling	2820	.3	10	8,460
Floor East Glass (Sun	2820	.3	5	4,230
Effect)	360	1.13	52	21,150
Total Tran	smission L	oad		49,360

В	tu./Hr.
People Load—110 people × 200 Btu/Hr=	22,000
Light Load—5,000 Watts \times 3.4 Btu./Watt \times .5 =	8,500
Electric Appliances 5,120 Watts × .5 × 3.4=	8,700
Steam Table, Copper Urns, Etc., 14,000 Btu. × .5 =	7,000
Internal Sensible Heat Gain (Table 2)=	49,360

Total Internal Sensible..... 95,560

Internal Latent Heat Gain

People Load—110 people × 180 Btu./Hr=	19,800
Steam Table, Copper Urns, Etc=	
Total Internal Latent	26,800

Ventilation Requirements and Heat Gain

Total	Air	_	Total Internal Sensible	-	95,560 $=5,900$
Total	Air	_	1.08 imes Diffusion Temp.	_	1.08 × 15 Use 6,000 Cfm.
0-4-11					0.000 (%

Outside Air
Sensible Heat Per Lb. of Outside Air22.96
Sensible Heat Per Lb. of Room Air19.80
Sensible Heat Gain of O.A. = $2,000 \times 4.5$ (22.96-19.80)
= 28,400 Btu./Hr.
Latent Heat Per Lb. of Outside Air14.85
Latent Heat Per Lb. of Room Air
Latent Heat Gain of O.A. = $2,000 \times 4.5$ (14.85-11.35)
= 31.500 Btu./Hr.

Total Heat Gain Sensible

Internal Ventilation																
Total									 	,			 		23,960	Btu./Hr.

Latent

Internal		
Total	 58,300	Btu./Hr.

Total Load on Coil and Compressor = 123,960 + 58,300 = 182,260 Btu./Hr.

"waterfall effect," causing undesirable drafts.

Where food is cooked it is necessary to have an exhaust system and in this store the client had an existing exhaust fan connected to a hood over the steam table, deep fat fryer, etc., as shown in Fig. 1. When selecting the amount of recirculation and the amount of outside air under design conditions it is necessary to consider the amount of air exhausted by the exhaust fan and make arrangements to provide at least this amount of outside air and preferably a little more in order to put the store under pressure. The present exhaust fan handles 2,250 cfm., which will also be the minimum amount of outside air for the airconditioning system.

This leaves in the neighborhood of 4,000 cfm. as a maximum to be recirculated. Between columns 7 and 8 on the first floor plan, there is a display counter which is of a permanent nature and we are allowed to locate the recirculating grille in the face of this display counter.

The manager of a drug store is naturally more interested in selling than he would be in handling an air-conditioning system so that it is important to have controls which are simple, but positive. The outside air intake should be sized for 100% outside air with a control to regulate it from a minimum of 2,000 cfm. to a maximum of 100% of the supply fan.

The thermostat in the occupied space should be automatically reset by the temperature of the outside air. This is very important in a drug store in as much as a drug store is not like the main dining room of a hotel (in load characteristics) where the patrons spend an hour or longer for a meal. In a drug store the average customer

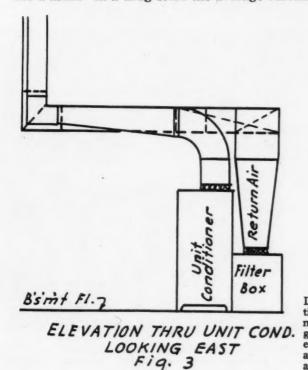
expects a quick lunch and usually is in and out again within fifteen or twenty minutes.

When a person enters a cooled room during hot weather his body is normally covered with perspiration and while this water is being evaporated from the surface of the body the individual actually feels several degrees cooler than the temperature of the room and with the average person this sensation lasts about twenty minutes. This is sometimes called "shock effect." As a result it is good practice to have less than the normal 15-degree design temperature differential for any establishments where the period of occupancy is less than 20 minutes. This usually makes the employees feel warm when the outside air increases in temperature, but in most places of business the customer is always right. We therefore select 12 degrees as the design differential for this store, meaning that when it is 95 degrees outdoors the store temperature will be 83 degrees.

3. The space for equipment is very definitely limited, and a thorough investigation shows that a factory built unit conditioner consisting of fans, filters and coils will just fit into the space, leaving room for a separate compressor alongside of the unit, thereby making the copper piping connections short. This is always desirable as long as there is sufficient room to make all the necessary connections.

This job consists of a fan, filter, direct expansion cooling coils, compressor, a control system, grilles and registers and the sheet metal distribution system. The cooling coils are direct expansion because the water available is city water at 75 degrees and could not be used to much advantage in cooling coils although it will be used for condensing purposes in connection with the compressor in as much as the water is being paid for by the owner.

The discharge air duct from the fan to the elbow where the ductwork enters the store proper (above the back-bar superstructure) should be insulated.

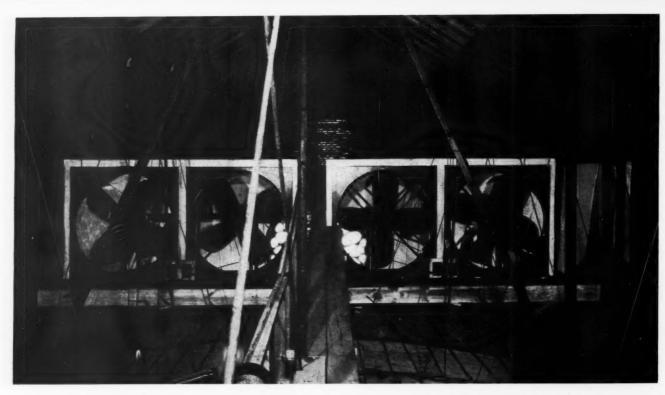


Details showing connection of duct work to equipment. Fig. 2 shows the general layout of the equipment space. Fig. 3 and Fig. 4 show elevations at apparatus where duct work connects.

ELEVATION THRU UNIT COND.

LOOKING SOUTH

Fig. 4.



The four Quietaire fans are mounted in a row in the frame shown suspended from the rafters. A specially-built housing, not shown, encloses the fans and connects to the intake grille as illustrated in the diagram following.

"Attic Fans" Ventilate a Large Houston Church

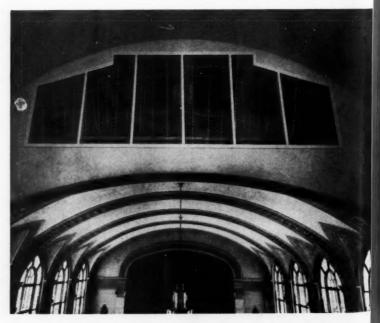
AN interesting application of "attic fans" for cooling a church by ventilation has been attracting attention recently in Houston, Texas. The church is the South Main Baptist, one of Houston's largest churches. The contractor who designed the system and installed the fans is Lansdowne and Moody, one of Houston's well known ventilation contractors.

As Mr. Lansdowne and his engineer, W. A. Forbes, describe the installation, the project is straight ventilation using practices well established in industrial ventilation work for many years and the only "attic fan" connection comes from the fact that the fans are located in the attic, in housings, and pull air into the attic prior to exhaust.

The most interesting detail of the installation is the air travel through the building. The elevation shows a rough layout of the system. The auditorium ceiling is suspended, forming a large attic through and above the trusses. Behind the auditorium is a two-story Sunday school building in which there are Sunday school rooms, offices and meeting rooms.

Air is brought into the auditorium through the first floor rooms of this building which connects with the auditorium through large doors. The air is pulled up to the auditorium attic and blown into the attic of the Sunday school building as

shown. In the hallway of the second floor of the Sunday school building five large (4 ft. by 8 ft.) grilles let the air under pressure in the attic enter these rooms and by opening second floor windows the air pressure clears and ventilates



The intake grille opens to the rear of the church. In winter, doors, at the fans, close off the attic. The boot to the fan housing slants upward from the grille.

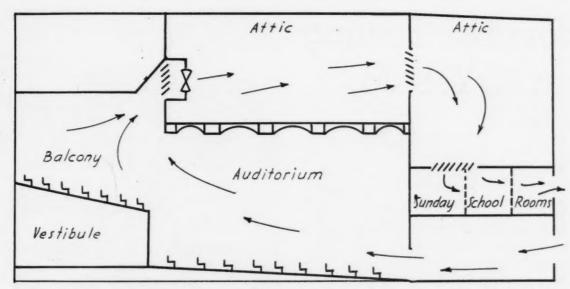


Diagram of the air travel through the church. Intake sweeps the first floor of the Sunday School building, the church auditorium and, leaving, ventilates the second floor rooms of the Sunday School building. Air also enters front door under balcony and passes through grille in balcony. This is not shown in sketch.

these rooms. Thus air flow is caused both by suction to the fan and by pressure from the fans.

Fan Data

The four Quietaire fans each have a diameter of 63 inches and a total capacity of approximately 100,000 cfm. The cubage of the auditorium is about 200,000 cubic feet so one air change every two minutes is obtained.

rch



View of hall grilles in second floor of Sunday School building. Air, on its way out of the building, enters the second floor through these grilles and passes outdoors through opened windows.

The four fans are mounted in a line and are housed in a specially built cabinet which connects to the grille in the truss face (see photograph) by a downward slanting box. This arrangement places the fans several feet above and behind the intake grille and eliminates all fan noise from the auditorium. For additional quieting, the fans are each suspended from rafters by band iron hangers and the fans proper are connected to a wind tunnel.

Mounting Fans Called for Ingenuity

Some interesting problems were encountered in mounting the fans. To get the fans into the attic the grilles in the Sunday school building hallway and the opening between the auditorium and Sunday school building attics had to be cut first and the openings used to get the fans and housing material into the auditorium attic. The suspended, plaster ceiling proved fragile and one dropped tool would have meant unsightly repair so orders were issued—"Carry no tools across the attic."

The cables which support the ceiling could not be cut, of course, so several such cables pass through the fan box.

The grilles in the Sunday school building hall-way are expanded metal, finished off with moldings and are provided with trap doors which can be closed in winter. The intake grille remains open for appearance, but doors are placed in the intake box, just ahead of the fans, so that the intake can be closed in winter.

The Reverend Westmoreland, pastor, declares that the system exceeds all expectations, operates so quietly that acoustics are not disturbed in the least and is most effective in providing comfort in Houston's summer climate.

AMERICAN ARTISAN, JULY, 1940 RESIDENTIAL AIR CONDITIONING SECTION

Evaporative Cooling at K. Y. U. M.

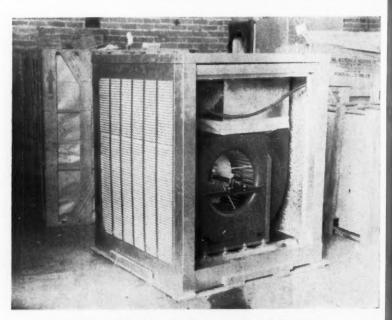
By Jos. C. Coyle

THANKS to the Desert Cooler, of which Yuma, Arizona, now has probably 3,000, many Arizonans of Yuma and other desert cities now spend the summer months at home, instead of fleeing from the heat. Even adjacent farm homes are now air conditioned. There is a desert cooler for almost every purse. Many of them are still installed in a window opening during the hot weather, then removed. However, most of the buildings constructed during the past year include a duct system, to connect with the cooler during the summer and with a furnace in winter.

A few of these still have the cooler outdoors and the heating unit in a room built for the purpose, but both connected with the air ducts. The new studio building of K.Y.U.M., as well as several of the better class homes now under construction or recently completed, has both cooler and heating plant housed in a small room connected with the duct system. A damper in the fan intake and another in the distribution line are used in shifting from cool to warm air, and vice versa as the seasons change. Cabinet type

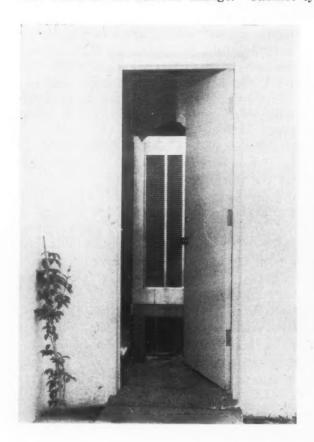


KYUM's building has 8-inch hollow concrete blocks, plastered walls, rock wool ceiling insulation and an attic air space.

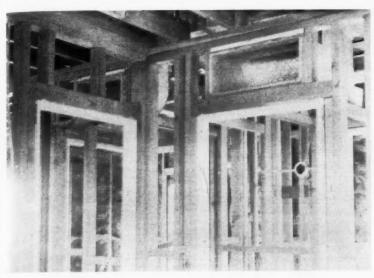


The studio desert cooler assembled before installation. One water pad is removed to show the blower.

Below—Will Blevins (left) with a cooler manufactured by the shop and C. F. Black (right) with a factory model cooler which the shop sells. At left—Cooler room at K. Y. U. M. with unit in place.







Supply grilles are located above doorways and are framed as shown here.



Exterior of the Yuma shop. Below-Plan of the cooling system in K. Y. U. M.

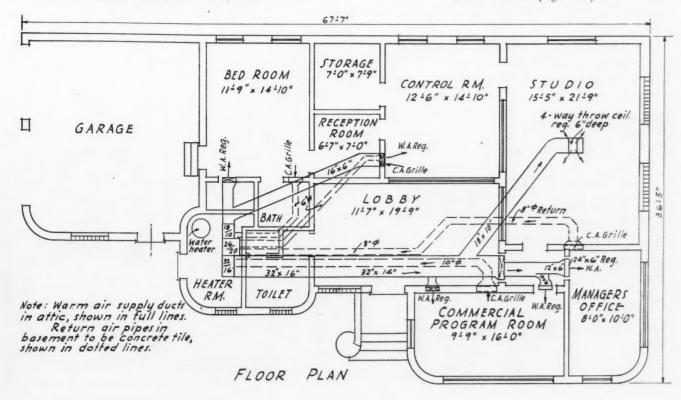
coolers are specially adapted for use in this kind of installation.

At K.Y.U.M. a Governor Model, Utility Air Kooler (sold by Imperial Valley Hardware Co.), with top delivery of 5000 cfm, was installed and connected with a water line. This model has three streamlined pad grilles which are easily removed and is equipped with a recirculating pump, thus using very little water. This feature is often important in regions where water is precious. When the unit is operating, air enters the room through a 26-inch square stack leading through the roof, and is drawn into the cooler through the pad grilles by a full floating blower.

A 16 by 32-inch main duct and branches leads to registers in the lobby, commercial program room and the manager's office with a 10 by 18-inch branch leading to a 4-way throw register in the ceiling of the studio (other registers are near the top of the walls). A 10 by 18-inch duct leads to a register in the hall to the bedroom, with a 6 by 16-inch branch extending to the control room register. The cooler is started and stopped with a switch in the office. Heating apparatus is not yet arranged for, but will no doubt operate by a thermostat.

All ducts and other sheet metal work on the building, including 96 linear feet of 7 by 7-inch belt molding for a Neon sign extending around the front and west sides of the building, 2,305 pounds in all, was installed by C. F. Black, sheet metal contractor, of Yuma. The ducts were fabricated in sections in the shop, using standard Pittsburgh and government locks. At the job they were assembled on the ceiling joists, covered with

(Continued on page 106)





Personalized Selling to "Satisfied Users." Is. Brice Gaston's Plan of Selling Attic Fans

In the summer of 1937, a baby arrived in the family of Brice Gaston, Dallas, Texas, heating and air conditioning contractor. That summer was hot, in long stretches, so, seeking a method of cooling his home, Mr. Gaston bought an attic fan and found, to the satisfaction of the entire family, that an attic fan really did produce excellent interior conditions. This first installation also taught the value of thorough insulation against vibration and noise, for the first fan was placed without insulation and, while good cooling results were obtained, rubber insulators and shock absorbers had to be included after a few days. Thorough vibration and noise elimination has been a prime requisite of every Gaston installation since.

This personal experience with an attic fan,

Mr. Gaston's mind for two years—to enter the sales field with an attic fan and capitalize on the extensive satisfied customer following already established by Brice Gaston in residential heating in Dallas. Brice Gaston, since 1937, has been a factor in attic fan sales in Dallas, perhaps not selling quite as many fans as some other dealers, but maintaining consistently the firm's established heating reputation for quality work.

crystalized a decision which had been forming in

In 1939, according to records, some fifty firms

Brice Gaston does consistent newspaper ad-

brice Gaston does consistent newspaper advertising. These are typical ads appearing in Sunday papers. Ads start about March and continue through the summer.











sold attic fans in Dallas. These fifty firms had at least 85 salesmen at work throughout the summer, so few Dallas home owners escaped contact with one or more attic fan salesmen last year.

As might be expected, in so large a group of dealers, some dealers do consistently good work, some do good work when they can get a fair price, and some few let nothing stand between them and an order.

Since Brice Gaston makes public capital of a list of satisfied users of heating equipment, the firm has, since it started selling attic fans, been one of the group of contractors cooperating with Dallas Power and Light Co., to make each attic fan installation deliver exactly what was promised. This means careful engineering, complete analysis of the house conditions, best available equipment and adequate provision for elimination of noise.

According to sales records of the firm, this quality installation finds readiest acceptance in the \$5,000 to \$8,000 house, whose owner wants a good installation and is willing to pay for it. The records also show that a 42-inch fan delivering an actual 12,000 to 13,000 cfm meets most such requirements and will give the owner at least one air change per minute.

Brice Gaston is particular about fan noise since his experience shows that a quiet installation seldom requires service or shows complaint, whereas a noisy installation always results in service expense and dissatisfaction. Three policies are insisted upon to eliminate noise. First—a quality fan, adequately large, of a capacity to permit running the fan below it maximum speed. Second—installation of the fan on a heavy wood base which is held off the attic floor or platform by numerous sponge rubber balls sunk in loose holes in the base and replaced annually. Also full canvas insulation between fan and housing and a smooth, large housing with grille. Third—low air speeds through the grille, the housing, the fan and out of doors.

The firm likes to locate exhaust louvres in several directions, so that no matter which way the wind blows one or more louvres are working.

Finds Manufactured Fans Superior to Own Make

The first fans sold by this firm were made in the shop using assembled materials, but the firm quickly found that these shop made fans cost more to build than better fans cost to buy and did not produce the results required. So for the last two years the firm has concentrated on Chelsea products.

In 1937, the first year of active fan sales, the firm installed 25 fans; in 1938, 50 fans; in 1939, 80 fans and hopes, in 1940, to sell nearly 200 fans of all sizes. During 1937 practically every fan went into an old house; in 1938 the records show 90 percent in old houses; in 1939, 75 percent in old houses and so far in 1940, only 50 percent in old houses. The decrease in old house sales has no particular meaning, in the opinion of the firm, excepting that the trend indicates greater acceptance of attic fans by new house builders and an increase in the number of \$5,000 to \$8,000 houses built in Dallas.

Brice Gaston firmly believes that satisfied customers are the best possible recommendation. This printed list shows several users of Gaston service in practically every Dallas neighborhood. Salesmen are drilled to use these names. The names are chiefly users of Gaston heating systems and service.

		SFIED CUSTO	DVERTISEMENT IS	;
Deliverity C R.	Graham, W. Wilmes and Beats. Green F. E	Brice Gaston Heating Co. Inc. ARE Distributes and delevered Dealers FOR THE FRANKE PURNACE COMPANY, Inc. STORY FOR THE FORMAN FORM FOR FORMAN FORM FOR FORMAN FORM FOR FORMAN FORM CONTINUE ON MANIET FORM FORMAN AND ENGINE FORM FORMAN AND STORY FORMAN FORMAN FORMAN CONTINUE ON MANIET FORM FORMAN AND STORY FORMAN FORMAN AMERICAN FURNACE COMPANY ET. LOVIN, NO. "Man' And Commissioning Units Distributed for Sections Of Section Of Section Of Section Of Section	Secretary A. S. Color Color	Wagier, E. F. Minorel Wols, Trans- Grant William V. E. Frein Versen Statistics William V. E. Will
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COOLERS

PROVIDE COMFORT COOLING AT LOW COST



Correctly Engineered for greater efficiency. Soundly constructed for dependable performance Compactly built for easy installation. Wide range of sizes to fit all jobs. Double Air Deflector for Controlled Air Distribution.

GASTON COOLERS

for Stores, Restaurants, Beauty Parlors, Banks, Mortuaries, Offices, Taverns

BRICE GASTON HEATING COMPANY

2918 LIVE OAK

DALLAS, TEXAS

The average installed price of attic fans has been about \$150.

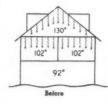
As stated, the "Satisfied Users" list from heating activities, has been chief source of leads to sales. No telephone solicitation or house-to-house canvassers have been used, but all owners of heating systems have been personally called upon.

This personalized selling to customers has been supplemented by consistent newspaper advertising. For example, every Sunday for 15 weeks in 1939 a Brice Gaston advertisement appeared in the Roto section of a Dallas newspaper. Similar advertisements began in March, 1940 and probably will continue throughout the summer,

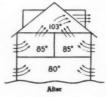
The salesmen, in their calls, are impressed with the importance of leaving with the prospect the folder (reproduced) showing "Satisfied Customers" since practically every Dallas neighborhood has several owners of Gaston heating systems. The salesmen also use the attic cooling folder (inside pages reproduced) which explains the fundamentals of this method of house cooling.

Some promotion has been launched on evaporative cooling. Gaston builds an evaporative cooler from manufactured parts and, although this field has been only tentatively prospected, it appears as though there will be an active market for these coolers. Special literature (reproduced) has been prepared for these prospects.

With evaporative coolers "taking hold" in many southwest cities, Gaston is building his own cooler and experimentally advertising it. Below—Typical direct mail folder given out by salesmen to explain attic fan principles to prospects unacquainted with the idea. Other pages show different fans used.



The GASTON SYSTEM of Attic Ventilation eliminates the high temperature found in the attic which often reaches 130° or higher. This excessive heat penetrates the ceil-ings to the rooms below, causing a hot stuffy un-bearable condition.





By the snap of the switch the GASTON SYSTEM Fan draws the cool outside air through the windows into the rooms and at the same time forces the hot air out of the attic, practically equalizing the temperature throughout. The cool breeze coming through your windows has the same cooling effect that you find while driving your car in the country on a warm day

Do not confuse attic ventilation with other types of fans or coolers. Attic ventilation does not

e the humidity in the dir The GASTON SYSTEM can easily in SYSTEM can easily maintain a comfortable tem-perature day or night. With the gentle breezes coming through your windows you can effect in the day time a cool condition, and real relief from the heat of the night so that sound and refreshing sleep is possible throughout the hottest summer. The GASTON SYSTEM of Artic Ventilation is low in until a cost and is designed to give you were in initial cost and is designed to give you years of satisfactory service. The operating cost adds very little to your electric bill.

GASTON SYSTEM ATTIC FANS ARE

ıþerior

Ask Your Neighbor Who Owns One

FEATURES - DE LUXE MODELS

- 1 A FIVE YEAR GUARANTEE-Assurance of quality
- 2 NEW PROTRUDING ORIFICE-Greater air or 3 CERTIFIED RATINGS-Members of the Fon Association
- A EFFICIENT BALL BEARING MOTORS-

- 4 EFFICIENT BALL BEARING MOTORS—Long life.
 5 UNDERWRITERS LABORATORY APPROVAL—Fire sade.
 6 AUTOMATIC BELT TENSION DEVICE—Proper tension.
 7 OVERLOAD PROTECTION ON MOTORS—Protects motors.
 8 MOVING PARTS RUBBER CUSHIONED—Quietness.
 9 FAULTLESS ALL STEEL CONSTRUCTION—Stability.
 10 DIE MADE BLADES—Precision balance and dilgnment.
 11 BALL BEARING PILLOW BLOCKS—Little attention needed.

Manufactured for us by the Chelsea Fan & Blower Co. of New York City

SPECIFICATIONS

Cet. No.	Capacity C. F. M.	Motor H. P.	7m Speed
E24D°	4500	1/4	580
E30D°	7000	1/4	420 315
E36D	9000	1/4	315
E42D	13000	1/3	270
E48D	17000	1/2	280
ES4D	20000	1/2	240
EMOD	23000	34	220
EN36D	9000	1/4	315
EN42D	13000	1/3	270
EN48D	17000	1/2	280
EU36D	8500	1/4	315
EU42D	12200	1/3	270
EU48D	16000	1/2	260

"Have sleeve bearings on shaft and motor.

Two Speed Motors Available.

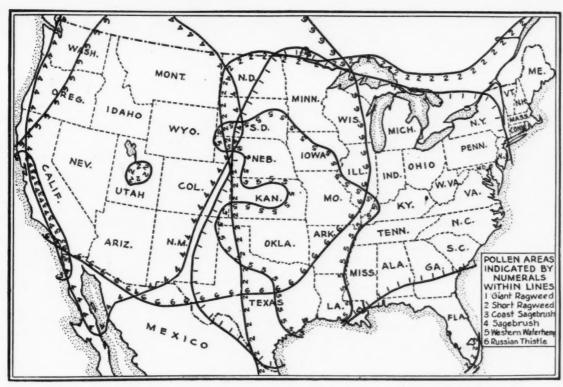


Fig. 3' Hayfever pollen areas for weeds in the United States, late summer and fall. Used by permission of Natural History Magazine and Dr. R. P. Wodehouse.

Air Conditioning For the Relief of Cedar-Pollen Hayfever [Part 2]

By Alvin H. Willis and Howard E. Degler
Research Assistant and Professor of Mechanical Engineering
The University of Texas, Austin, Texas

III. ALLERGY AND HYPERSENSITIVITY†

THE person with allergy is an individual who inherits some peculiar constitutional makeup which causes him to become sensitive to certain things. Therefore these particular things become violently poisonous to him, even when encountered in minute amounts. Allergy patients may become sensitive not only to material things but also to physical agents such as light, heat, or cold. Sensitiveness may develop to such an extreme in certain people that they may be affected by a millionth of a milligram of a substance which may be devoured as food by a nonsensitive person.

Allergy is a real condition, its manifestations are grave. Whenever a person of allergic strain comes in intimate contact with an agent to which he is sensitive, he is certain to have a definite illness which may be mild, severe, or grave, depending upon the degree of contact.

the blame for his illness on some flowering plant blooming at the same time; for example, goldenrod, sunflower, or daisy. The fact is that goldenrod, sunflower, or daisy are practically never a cause of hayfever or asthma. A person sensitive to some fungus in house dust may blame for his illness, his wife.

Heredity

Allergy is one of the most consistently hereditary of all diseases. If heredity comes from both sides of a family, the illness is likely to appear in the child at an early age. Since it appears that

The agents responsible for allergy are usually infinitesimal in size and inconspicuous. For this reason, a patient sensitive to a certain agent may

be inclined falsely to blame his illness on some-

thing to which he is exposed simultaneously

which he can see. For example, a person sensi-

tive to the inconspicuous ragweed usually places

^{*}Engineering Research Series No. 31, The University of Texas, Bureau of Engineering Research. Edited and reprinted by permission.

[†]Material in this chapter was taken from "Allergy and Hypersensitivity" by Dr. W. W. Duke in the Modern Home Medical Adviser, edited by Morris Fishbein, M. D. Used by permission.

persons of allergic strain tend to intermarry, this is an important factor so far as the age of onset of the trouble is concerned. Whereas the allergic constitution is hereditary, different members of the same family may become sensitized to widely differing substances.

Natural and Acquired Sensitiveness

We are at a loss to know why one individual becomes sensitive to one foreign agent and others to another. It seems in many cases that an illness has something to do with it. For example, rather frequently a patient will date the onset of pollen disease from an attack of the measles, scarlet fever, pneumonia, or influenza. As a general rule people are most likely to become sensitive to something with which they are in intimate contact at frequent intervals and which they meet with in traces rather than in quantity, such, for example, as the common pollens of the environment in which they live, or dust material which they meet within their homes or places of business. Contact must have something to do with the development of sensitiveness, for Europeans were never found sensitive to American ragweed. Ragweed does not thrive in European countries.

Agents Which Tend to Sensitize Pollen

Pollen is apparently the commonest of all causes of allergy. Symptoms caused by it are usually hayfever and asthma. Occasionally, it causes eczema of the hands and face and neck. In this case the oil of the plant can have the same effect, so that this type of eczema can occur during the summer months.

Pollen cases usually give seasonal symptoms, in temperate climates occurring in the spring, summer, or fall. Cases which occur in the spring are caused, as a rule, by tree pollen which is set free in temperate climates between March and May. In southern climates, however, mountain cedar may pollinate during the winter months. Summer is the great grass season. In temperate climates, one or another of the grasses may pollinate between the middle of May and the middle or latter part of July. In southern climates, however, Bermuda grass may pollinate throughout a much longer season or even during the winter months. The weed season starts during the fall months, in the temperate climates between the first to the twenty-fifth of August and terminates, as a rule, with frost. Patients who have symptoms following the fall season which last throughout the winter months are, frequently, also sensitive to heat, cold, or to some object which they encounter during the winter months.

The important pollens of a given district are the pollens of some tree, grass, or weed which grows in abundance and blooms inconspicuously, see June issue. A flowering tree or grass or weed rarely causes trouble because of the fact that little pollen is produced by a flower and little escapes from the plant. Even the pollen of the corn is rarely carried far enough from the cornfield to affect people who do not live in the immediate vicinity of the growing corn.

Animal Hair and Feathers

Sensitiveness to animal hair and feathers is an important cause of hayfever and asthma but is rarely to be compared with sensitiveness to pollen or foods. Patients may be sensitive to one or several animals. They may be sensitive to the animal itself, its cured products, or both. The latter, however, is rare as compared with the former. Horse sensitiveness is the commonest type of animal sensitiveness. Less often there is sensitiveness to cattle, sheep, hogs, dogs, cats, rabbits or guinea pigs. Of the fowl, sensitiveness to chickens, ducks, geese, or pigeons is more common. Less common are sensitiveness to the cured products used in pillows and mattresses.

Molds and Fungi

During the summer months, spores of fungi known as wheat rust or corn smut fill the air; in fact, in quantity, frequently exceed grass pollen. Also, molds that grow on the leaves of trees and bushes are important. One man was sensitive to a mold which grows on the bark of trees and was subject to unsightly eczema of the face and hands during the winter months owing to the escape of the spores from the bark of firewood. Certain molds that grow in houses in dry places, in rugs, curtains, and upholstery, are responsible, apparently, for hayfever and asthma in people who have trouble in certain houses but who are free from disturbance in other houses.

Insects

Two types of allergy are caused by insects, one by the bite of the insects, the other by scales and hairs which are thrown off from insects of the moth and butterfly group. The former can cause violent general reaction, even death, as a result of one or several bites or stings of some particular variety of insect. The latter type (moth and butterfly) can cause hayfever, asthma, and eczema in certain districts in which insects of this variety abound. This discovery is a recent important advance. The insects commonly responsible for this type of allergy are inconspicuous in color and size. They can be observed above lawns at night during the summer months if the lights from an automobile are cast across the lawn. They are

(Continued on page 102)

SHEET



DEVOTED TO SHEET METAL CONTRACTING AND FABRICATING



Checkmate water with YOUNGSTOWN GALVANIZED SHEETS

The old hot air furnace poured the atmosphere of the Sahara Desert into a house. But the modern winter air conditioning job is sweeping ahead because it brings healthful, life-giving moisture to home atmosphere. But along with the moisture comes corrosion trouble for the ducts and for you, too, unless you have installed well galvanized sheets.

That's why Youngstown has been exercising the greatest possible care in making Youngstown Galvanized Sheets. Where a pin hole in the zinc covering would spell trouble, Youngstown makes sure of complete zinc covering by thoroughly

cleaning sheets before galvanizing and by passing sheets slowly and steadily through the galvanizing bath, inspecting every operation and ruthlessly discarding any sheet not up to the Youngstown standard.

When you put in a duct job, the workability of Youngstown Sheets will help you get a job in as planned -- and after the job is in, your reputation will be protected from kick-backs on quality of material. Youngstown Sheets help you make more money on each job -- and assure satisfied users which helps you get more jobs:

Sheets - Plates - Pipe and Tubular Products - Conduit - Tin Plate - Bars - Rods - Wire - Nails - Tie Plates and Spikes. 10-98

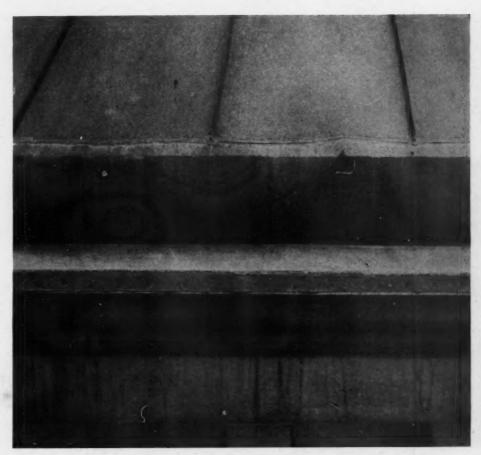
THE
YOUNGSTOWN
SHEET AND TUBE COMPANY
Manufacturers of Carbon and Alloy Steels
General Offices - YOUNGSTOWN, OHIO

Expansion -

Must Be Provided For In Every Copper Roof

By Carter S. Cole Engineer, Copper & Brass Research Ass'n

Article I of this series (June issue) discussed proper "anchorage" for roofing sheets. But anchorage cannot be divorced from expansion and contraction since sheets and sections must be free to move as temperature changes. This article explains expansion, its extent, and methods of providing for such movement.



This gutter with the outside edge nailed and inside edge soldered to the roof is not "anchored." An edge strip (see next page) should have been used. This construction ran over 200 feet—no wonder trouble developed. Soldering gutters to roof will be discussed in a later article.

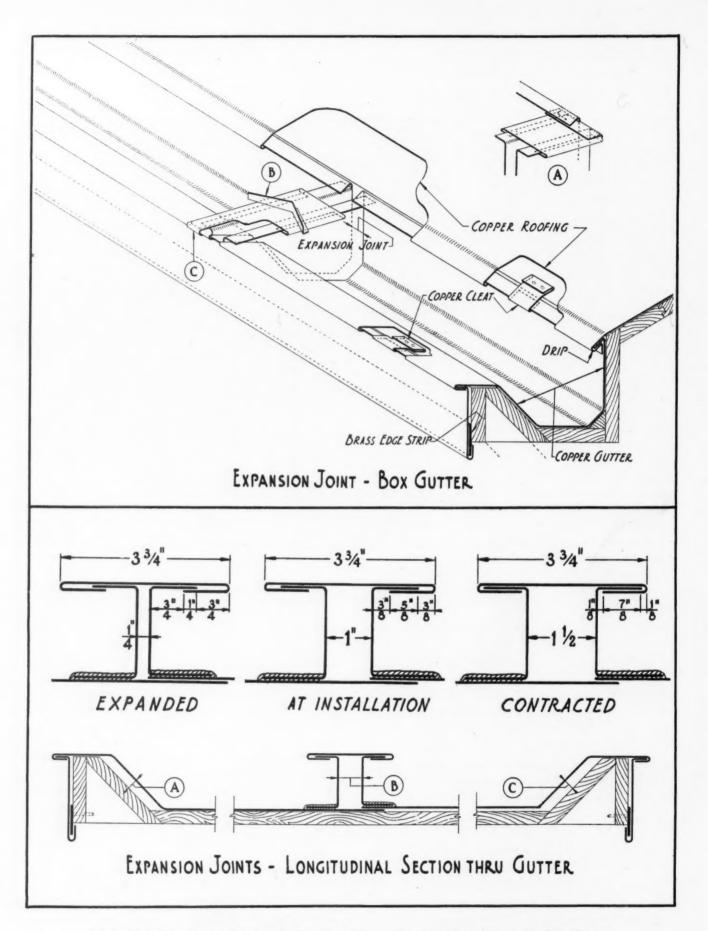
In the first article of this series we discussed "anchorage" and its function in the proper laying of a copper roof. It was pointed out that the anchorage (cleats, edge-strips or reglet-strips) performs the dual function of holding the roof securely and yet permits movement due to expansion and contraction. It is logical, therefore, to consider next what expansion and contraction are and how to provide for them.

Divide the Roof Into Small Sections

The first basic principal in providing for expansion and contraction is to divide the roof area so that as little allowance for movement as possible has to be provided for at any one point. Thus, on sloping roof areas we break up long longitudinal runs by the use of standing seam construction or by batten seam construction. These looselock seams prevent the building up of movement beyond the width of the sheet. Experience indi-

cates that sheets 20 inches wide give the optimum service with standing seam construction although 24-inch sheets are usually satisfactory. With batten seam construction 24-inch sheets seem to give the best service, while 30-inch sheets are permissible. In both types of construction, sheets eight feet long are considered standard, but sometimes shorter sheets are employed. Cross seams in either method should be loose-locked wherever possible and not soldered except as a last resort. On very low pitches, cross seams filled with white lead or double-locked are recommended in preference to solder.

In flat seam construction it is generally more difficult to provide adequately for expansion and contraction. One method is to use small sheets as noted in the preceding article, 14 by 20 inches, as these give better service than larger sheets. Even with this construction it is, however, generally necessary to make some additional provision for expansion. When this is required along



Details from Sheet Copper Handbook, Copper and Brass Research Association, showing, above—Correct method of anchoring gutter along outside edge and locking inside edge to roof. Anchorage is provided, but movement is also permitted. Middle—How a gutter length moves with changes in temperature from cold to hot. Below—Details of edge anchorage and construction of an expansion joint. The joint must be as high as the gutter is deep.



Solder must have been "cheap" when this roof was laid. The expansion joint looks as though it ought to work, but it didn't. The joint was put in as an after-thought and the nails in the end of each gutter lining sheet were not removed. The gutter leaked, because it could not move.

a line which is parallel to the slope, an expansion batten may be employed. When it is necessary to break up a flat seam area into smaller units on a line across the slope, a drop or change in level is generally required.

This brings out another point; that is, the steps which we take to provide for expansion and contraction. It is always good practice to keep different roof areas separated from each other by loose-lock seams so that any movement of expansion or contraction originating in one area cannot be transmitted to another area of the roof. For example, a sloping, standing seam area should be connected to a built-in gutter by a loose-lock seam. This subject will be further discussed later under the heading of "Intersections."

Copper Expansion

Just how much does copper expand? The calculation that determines this is very simple. The coefficient of linear expansion of copper is 0.0000095 in. per degree F. (thickness, of course, does not affect this figure). To make this calcu-

Detail of a step-down, horizontal expansion joint for a large roof which had to have expansion between ridge and gutter.

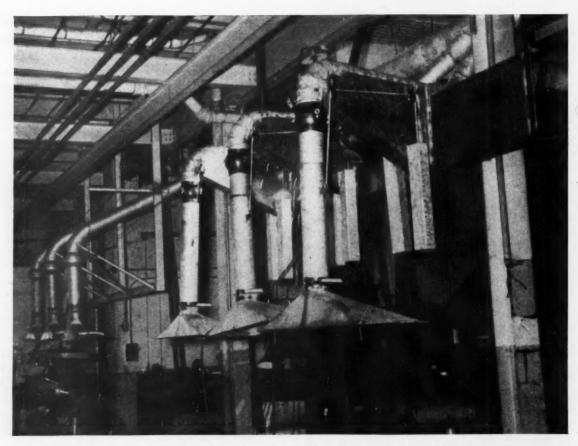
lation easier, let us call the coefficient 0.00001. In most parts of the United States we can figure that the minimum temperature will be 10° below zero and the maximum about 100°F. At this high temperature there will be some superheat in the copper, say 40° F., so that the maximum range of temperature is approximately 150°. Therefore, in 40 feet or 480 inches the total movement will be .00001 x 150 (deg.) x 480 (in.) which equals .72 inch or approximately 3/4 of an inch. If the roof is laid at a temperature near the midpoint of this range, say 65° F., half of this total movement will be expansion and half contraction. If it is laid above or below the midpoint our provision for expansion and contraction must be changed accordingly (don't lay copper tight in cold weather).

Gutter Construction

Gutter construction usually presents situations where an understanding of the proper method of providing for expansion and contraction is often lamentably absent. The gutter lining should be installed as a "floating unit." These floating sections should be separated at intervals of approximately thirty feet by expansion joints and the metal should be free to move to and from them.

Standard details of construction are shown in the accompanying figures taken directly from the Sheet Copper Handbook of the Copper & Brass Research Association. In the top figure, it will be noted that the gutter lining is "anchored" on both sides, not held rigidly, and is free to move.

(Continued on page 112)



New, all-welded system in foreground. Older, riveted and seamed system in background. Note the substantialness of the new, welded installation. The deep boxes are housings for the hood counter-weights.

Compare with detail facing.

All-Welded Fume Removal System

FLESCH AND SCHMITT, INC., Rochester, N. Y., one of New York State's best known sheet metal and roofing organizations has, within the last three years, applied welding to increasing numbers of fabricating operations formerly seamed, riveted, or metal screwed.

The reason for this change-over, according to Wm. J. Schmitt, is that welding is faster, cheaper, stronger and, generally, results in a substantial saving in the number of shop operations required to produce a certain piece of work.

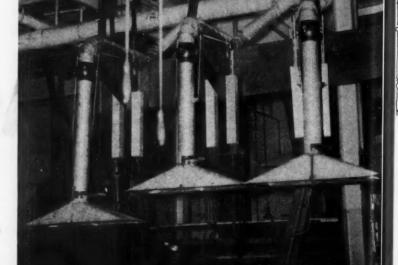
All materials are being welded, including materials which heretofore have been considered difficult to weld. For example, galvanized iron in both heavy and light gauges is now welded as a matter of course and, according to Mr. Schmitt, without difficulty once the welder has learned the necessary, simple precautions.

Of course, certain changes in forming and assembly have been necessary to join by welding instead of seaming or riveting. Seams to be welded must be readily accessible; pieces are

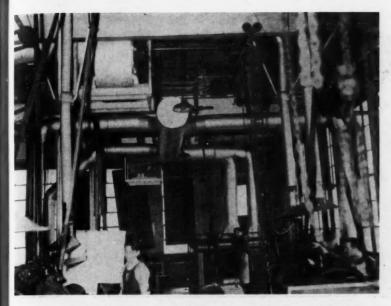
made large enough and few enough to avoid costly and intricate jigs which might be necessary if a large number of small, irregular pieces had to be held together in position for welding.

The welding, instead of riveting, seaming, etc., has been taken into the field and a portable welder quickly makes assemblies monolithic at less cost and with less labor time than former operations.

An interesting example of these improved practices by Flesch and Schmitt is illustrated by the fume removal system shown in the photo-



Front view showing shape of the double hoods and flexibility provided by three adjustable hoods in place of a single hood.



This plant has many fume removal systems. This shows a group of hoods connected to a main and exhauster. All pipes are painted with aluminum paint.

graphs. This system is installed in a plant making and refinishing engravers rolls. In the process the large and heavy rolls are placed in a lathe and the surface refinished. Nitric acid is used in the process and the fumes given off during the work are noxious. It is necessary to remove these fumes as quickly as possible and as near the source as possible. Hoods which can be lowered to within a few inches of the fume source are needed.

In this particular case the three hoods shown were recommended because the hoods have to be raised, out of the way, to provide space to swing the rolls into and out of the lathe. Also, work proceeds slowly along the roll and may be restricted to a short length of the roll for a considerable period. Having three hoods, only one hood need be open when work is progressing thus reducing the withdrawal of warm air from the plant. This is a consideration in this plant be-

Ball joint

Bracket

Counter balance box.

Diagram of welded construction showing welded pipe seams, pipe welded to bracket, bracket welded to channel. The complete system is a single unit.

cause numerous machines throughout the building are hooded and the air volume withdrawn with all hoods open would make a serious heating problem.

One of the photographs shows the new battery and in the background an older installation. A comparison indicates that the new installation is more substantial than the old and that much of the improvement is due to welding.

A heavy channel supports the three hoods. Onto this channel three box-shaped brackets are welded as shown and reinforced at the connection by heavy angle iron. The exhaust pipe lies in the trough of the top and nose as shown and was welded at all seams for air tightness and greater strength. The pipe from the ball joint to the elbow into the main was welded into one unit in the shop and the full pipe was then welded to



Flesch and Schmitt believe in shop organization for efficiency. The lock forming machine occupies a bay and is served by the rolling tables shown here. The leg enlargements provide a large base for the caster plates.

the bracket along two sides. From the ball joint to the branch elbow into the main the three pipes, three brackets and the channel are, then, one welded assembly.

To permit raising and lowering the hoods, a sleeve, as shown, is employed. The weight of the outer sleeve and the hood is balanced by weights in boxes (see sketch), the connection by chains running through pulleys.

The hood is irregular in shape and is double with air slots between the inner and outer hood. Both hoods are welded at seams and the lower edge of the outer hood is stiffened by a heavy rod in the rolled edge.

The field welding required consisted only of welding the new branch pipes to the old main line as the channel, brackets, and pipe were all welded as one unit in the shop and delivered ready for erection. Bronze rod welding was used throughout.





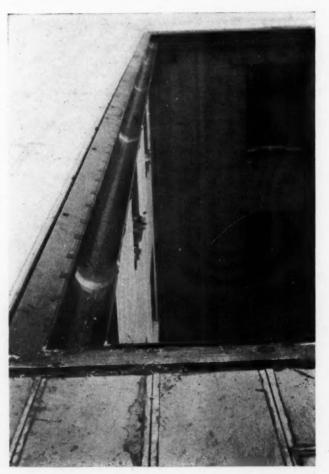
Nassau Court House 25-Ton Copper Roof

By R. C. Nason

WEATHER-TIGHTNESS for years to come is anticipated from the installation of 16-oz. batten type, copper roofing on the new Nassau County, Long Island, court house installed by the Webster Sheet Metal Works, Bronx, New York City. Included also in this sheet metal contractor's order are some 8,000 linear ft. of heavy Cheney through-wall cap flashing, window head flashing and sundry other forms of metal protection. Copper, bright and leadcoated, was used throughout the building the total quantity exceeding 35 tons.

Due to the somewhat broken roof lines on this structure, the total roof surface covered with sheet metal is difficult to measure accurately, but it is certain that over 200 squares were so cov-

ered. William Dibo, partner, speaking for the Webster company, describes the features as pine



Closeup of a 9-in., 20-oz. copper, hanging gutter. Inside edge cleated to edge-board. Outside edge reinforced with $\frac{1}{2}$ -in. bronze rod in roll. Bronze ring and circle hangers used for support.



Above and at top of page—Views of the court house roof with copper partly laid. Note method of starting rows from the valleys, staggering first horizontal seams. The wood battens are 1¾ in. wide by 1½ in. high, bolted.





Left—Frame of hip-ridge, 20 oz. copper skylight. Rafters have covers held by brass bolts. Right—One of seven flat skylights. This one measures 34 ft. by 8 ft. The Gypsum roof slabs are bound with galvanized iron stripping.

battens 13/4 in. wide by 11/2 in. high, flat on top, sides perpendicular and fastened with ½-in. bolts. Bolt heads, 2 ft. on centers, were countersunk. Sheets 24-in wide by 96-in, long were used for the pans with horizontal seams in adjacent bays staggered. This construction required starting alternate bays with half-length sheets. Cross seams were double locked and not soldered. Work procedure followed standardized practice.

All gutters about 3,000 ft. in total length, are of hanging, half-round design. Their inside edges are attached by cleats to the roof sheathing, the cleats being folded over nailheads. Support is by means of bronze shank and circle hangers on 2 ft. centers. Gutter widths vary from 9-inch to 6-inch, with sizes about equally divided between 9-inch, 8-inch and 6-inch. Gutter metal was 20oz. throughout. Exterior edges are reinforced with 1/2-in, rods within beading. Drainage is internal.

Flashing on the new court house is widely varied, consisting of cap, open valley, curb, skylargest quantity items is in the 8,000 linear feet

light, plus miscellaneous other types. One of the

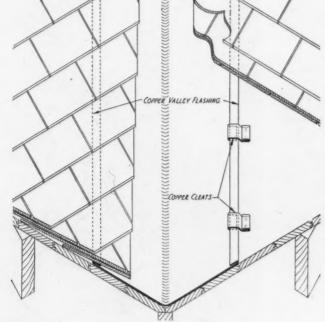
of Cheney throughwall cap flashing. This was installed as shown in a detail.

Skylights include both hip and flat designs, although the former predominate as to size. For example, there is one large group of six units each 40 feet long by 14 feet wide. These units, like those of flat construction, were made by a skylight specialty fabricator, Best Metal Products Co., Long Island City, of 20-oz. leadcoated copper applied to heavy angle iron reinforcing frames and attached with brass bolts. Flat units were laid on reinforcement of 3-in. channel iron framing. Erection was by the Webster company, who also installed considerable flashing over skylight curbing, of 16-oz. bright copper. This contractor installed 7 skylight units of flat type, plus 11 relatively small hip-design units. Sizes 8 feet x 12 feet and 3 feet x 8 feet predominated.

Curb flashing represented still another sizeable item, since there are all together 48 skylights, 40 of which received Century ventilators on ventilation duct termini. Ventilators, as well as curbing, are of copper, as also are the air conditioning contractor's ducts for a distance of some 25 feet beneath the roofing. Taking roof ventilators and copper ducts into consideration, in addition to the Webster roofing, flashing and miscellaneous applications, copper tonnage in this

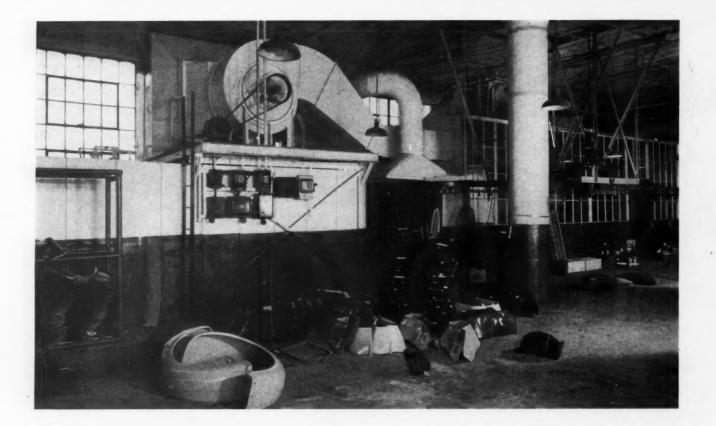
(Continued on page 111)

At left-Method used to cleat valley sheets excepting that copper roofing is used instead of tile. Below—Wall flashing method against rising walls, also base flashing and scupper flashing employed.



CEMENT FINISH BRASS STRAINER OUTLET TURE OUTLET WITH SCUPPER

AMERICAN ARTISAN, JULY, 1940 SHEET METAL SECTION

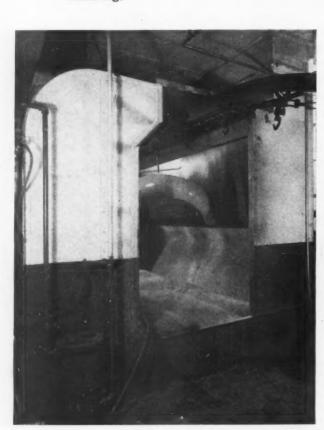


Spray Paint Booth and Drying Oven

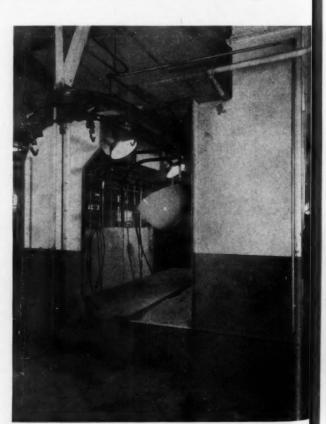
In the mass production industries employing spray paint finishing, lost motion and waste travel of parts is a serious handicap and systems are designed, accordingly, to reduce the time element and travel length of parts from the spray booth through drier, to the unloading station. This requires a nicety of judgment and complete control of all the elements which enter into spray finishing.

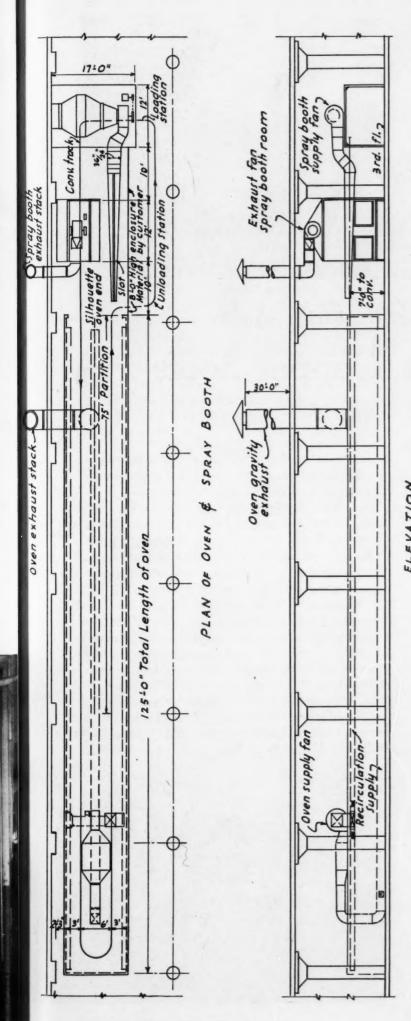
The designer of the apparatus and the installer of the system must, therefore, understand fully what is to be sprayed, what spray material will be used, how long a time is required to dry at the temperature required for drying and how items are to be loaded and unloaded.

A case in point is the wet spray system for small parts shown in the accompanying drawings and photographs. This system was designed and



Above — General view of spray booth (in glass enclosure) and entering end of oven. Large fan is supply to glass enclosure. Left and Right — Paint spray booth showing operator's platform and exhaust hood. Compare with diagram facing for construction of booth.





installed by Industrial Sheet Metal Works, Inc., Detroit, for a plant where a variety of small parts are spray finished in different colors, immediately dried and delivered for assembly or shipping.

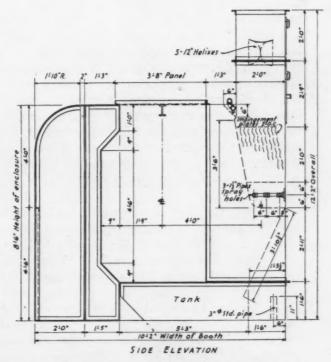
In this system parts to be finished, about 150 parts per hour, reach the spray operator on a traveling mono-rail conveyor (see photos). The speed of the conveyor—4 feet per minute—is controlled acording to the time required to spray the part being finished. The parts on the conveyor leave the spray booth and enter the drying oven without handling, pass through the oven and back to the unloading station (see plan).

How System Is Designed

For systems of this type Industrial buys such apparatus as fans, filters, liquid piping, conveyor, and similar items, but fabricates the oven, duct work, housings, and connects to this work their own spray booths. On the installation shown, then, the spray booth is a standard model; the supply and exhaust systems are designed and installed to the actual limitations of the job; the drying oven is fabricated and installed to existing conditions.

Industrial handles the sheet metal fabrication of such an order as a combination shop and field fabrication problem. The system and its component parts are laid out on the customer's floor. Apparatus is located and measurements made from base lines so that the shop can fabricate all pieces ready for erection. In this case, the oven was laid out in the proper floor bays; the angle

(Continued on page 116)



Left—Plan and elevation of oven and booth showing apparatus and dimensions. Above— Detail of booth construction.



Copper Roofs Co., Houston, Has Sold 1,500 Three Oz. Copper Roofs

By C. A. Loeffler

M ORE than 1,500 "Double Lock" 3-oz. copper roofs have been sold and installed in Houston, Texas, since the Copper Roofs Company of Houston began operations in Houston in 1936.

In addition to the age-long record of copper roof serviceability, Roy D. Bagaley, local manager of sales for the concern, believes that the fundamental secret of the light weight copper roof's success is value and specialization. As to value, the long-lasting metal roofs practically pay for themselves in their freedom from maintenance costs. As to specialization, the Copper Roofs Company of Houston offers no other services or no other commodities save the sale and installation of 3-oz, copper roofs. There is, therefore, no distracting influence to draw the attention of the company's personnel from concentrating on roofs and the full experience of the organization is focused on design and installation of roofs.

Sales Personnel Training

Thorough training of salespeople and technicians is stressed. It's necessary to spend money before you can make money, Mr. Bagaley believes, and, before a salesman is permitted to call upon the public, he is given intensive training in the selling of this one commodity.

Mr. Bagaley has no objection to experienced salesmen, but he does not want a salesman who has previously sold other types of roofs. He very much prefers to train his men from the ground up, and for that reason prefers a man without prior roofing experience. In that way, he does

not have to overcome any preconceived ideas as to what constitutes a good roof and what is good sales technique, in selling roofs.

Mr. Bagaley likes men over forty. They are more settled and are of an age to deal successfully with people who are in the market for roofs, either new or replacements. Mr. Bagaley says no salesman under thirty-five has proven a success in the company's particular line of selling.

The primary thing stressed in training is a thorough knowledge of the principles of the application of "double lock" copper roofs. Besides the 30 days' intensive training, the new salesman attends the three sales meetings held each week. After about three days' preliminary training, the new man accompanies an experienced salesman on his daily rounds, merely, of course, as an observer. When he makes his first independent call, he is taught to first sell the prospect on the



AMERICAN ARTISAN, JULY, 1940 SHEET METAL SECTION

idea of a definite appointment, when he may call back and really present to the prospect an exact picture of how double lock copper roofing will fit the prospect's needs, as reflected by the data the salesman has worked out from information gleaned during the preliminary call.

Secondly, he must sell the customer on the everlasting qualities of copper. Also the new man is instructed not to quote prices on this first call. The reason is that copper, being slightly higher in first cost than other more temporary forms of roofing may be placed in an unfavorable light in the prospect's mind until he is sold on its life-long, upkeep-free virtues. As a further aid in selling, the new man is given an unusually thorough and complete sales manual and sales kit.

Ordinarily six salesmen are employed. They operate without restrictions as to territory, pros-

pects, builders, etc.

Mr. Bagaley states the peak sales season in Houston is from February through October. Up to date, the firm records show that about 75% of all roofs laid are re-roof (over old roofs or on old buildings) and 25% are new roofs on new houses.

3 oz. Roof Costs

As to costs in Houston, the cost of double lock, copper roofing is \$20 per square, applied. This is three times the cost of shingles, three times the cost of composition, while the cost of slate roofing is about twice as much as for double lock copper roofing. Clay tile costs about the same as the copper, while glazed tile costs about three times as much as copper. Asbestos roofing sells for about half as much as the copper.

Not much reliance is placed upon any other media except salesmen for the selling of these roofs. Newspaper and radio advertising are never used, and not much cold canvassing is done.

Billboards and posters are not used.

Salesmen call regularly upon architects, and secure orders through them by emphasizing the excellence of the product. Building reports are, of course, scanned, and, in the course of cruising about the city, when a salesman spots an old or





a defective roof, he immediately gets in touch with the owner and, if possible, sells him on the advisability of installing the lightweight copper

Another source of sales contacts is through booths at Home Building Shows, etc. An attractive album of beautiful homes is on display and the toughness and durability of 3-oz. copper is strikingly demonstrated by the following means: A sheet of lightweight copper is laid across a wooden block, the prospective customer is handed an ordinary claw hammer and invited to pound away at the copper sheet. Of course, it always withstands his onslaughts. This establishes the claim of tougness, since the prospect knows the roof of his house is not likely to be subject to such rough treatment.

Sales Features Stressed

Other aids to sales are the well-gotten-up booklets, showing the advantages of copper roofing and answering frequently raised questions concerning the nature and the installation of 3-oz. copper roofing. A number of these booklets are kept on hand in the display room of the company and handed out to inquirers.

Of course, an easy budget payment plan is available to those who desire it. Terms are frequently less than \$10 per month for copper-roofing the average home.

> The photographs of houses illustrating this report show typical light-weight cop-per roofs on several styles of dwellings. The effect of light and shadow, used as a selling appeal, is plainly ilustrated.

Sales points emphasized are:

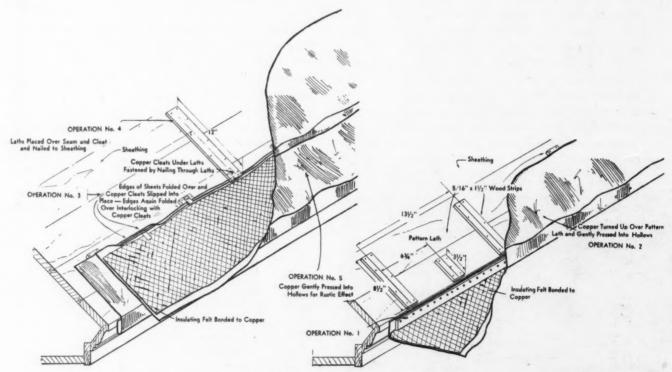
- 1—Low Price: Copper roofs are now available in Houston at prices comparing favorably with less durable materials.
- 2—Insulating qualities: Tests show this roof keeps buildings cooler in summer and warmer in winter.
- 3—Beauty: Copper grows more beautiful with age.
- 4—Economy: Copper roofs reduce fire insurance rates; eliminate upkeep costs; save on heating bills.
- 5—Light Weight: 3-oz. roofs eliminate necessity for expensive supporting structure.
- 6—Fireproof: Copper can not burn.
- 7—Durable: Copper has stood the test of centuries.
- 8—Hailproof: Has actually withstood severe hail storms all over the country.
- 9—Hurricane-Proof: No "Double Lock" copper roof installations were reported damaged in the New England hurricane of 1938.
- 10—Lightning Protection: U. S. Weather Bureau says: "A copper roof, well grounded, is an excellent lightning protection."
- 11—Easily Installed: Especially desirable for re-roofing, since the light-weight copper can be applied right over the old roofing, thus saving the expense and bother of removing and carting away old shingles.

The technique of applying 3-oz. copper roofing is the same the country over, Mr. Bagaley states.

First, a 15-lb. asphalt saturated felt is nailed securely over sheathing boards with a lap of 2 inches. The starter or anchor strip (Fig. 1) is fastened to the eaves' edge, felt side out, with 4-ft. laths or half rounds to form a positive drip edge into gutter (Operation 1 in Fig. 1). Lath, cut to $8\frac{1}{2}$ -inch and $3\frac{1}{2}$ -inch lengths, are alternately nailed $6\frac{3}{4}$ inches apart on centers. The starter strip is then turned up and molded over the starter or pattern laths (Operation 2, Fig. 1).

The second copper roofing strip is double crimped to the first, the double crimp to be 3/8 inch wide. Copper cleats, spaced 63/4, inches on center, are inserted into the first fold and folded a second time (Operation 3, Fig. 1). Cleats overlying the tops of the 81/2-inch pattern lath of the starter course are nailed with 3d copper nails. Laths, 12 inches long, are then laid over the alternate cleats and a 3d copper nail is driven through each lath and the underlying cleat (Operation 4, Fig. 1). The nails thus do not pierce the copper roofing strips. Laths are anchored to the roof deck with 3d to 5d cement coated wire nails, depending on the thickness of the sheathing boards. The second course is then turned and moldered over laths (Operation 5, Fig. 1). The above operations are repeated for each succeeding course to completion of the roof.

Complete construction details have been developed for valley, ridges, eaves, flashing, etc. Generally these recommendations follow metal roof construction. The full instructions are contained in a manual which the prospect may study if interested.



Construction of a 3-oz. copper roof step-by-step is described in the details above. Follow the steps numerically for the procedure followed in laying the metal.



THIS order went all the way from our St. Louis warehouse to Sherman, Texas—so it is easy to see why our customer was so pleased with both Scully and railroad service.

All over the country there are thousands of Scully customers who can testify that Scully is always on the job on regular as well as rush orders. Each of the eight Scully warehouses operates on

the principle that our customers always want prompt service — so we hurry whether you ask us or not. And no matter how large or how small your order may be, it will receive the same prompt, friendly attention.

Why not call Scully the next time you need steel? And ask for a copy of the handy Scully Stock List and Reference Book. It's free, of course.

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ALLOYS
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ALLOYS (HR and CF)
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REINFORCING
BEAMS and C. B. SECTIONS
BEEF RAIL
BOLTS, NUTS, WASHERS, ALL KINDS BEEF MAIL
BOLTS, WASHERS, ALL KINDS
BORING and TURNING BARS and
GRINDERS
BRACES, BOILER
CHAIR, ALL KINDS
CHANELS
CHISELS CHUCKS, STAYBOLT CHUCKS, STAYBOLT
CLAMPS, BOILERMAKERS
CLIPS, PATTERSON
CLEANERS, FLUE
CONDUCTOR PIPE
COPPER AND BRASS
COUPLINGS, HOSE
CRAYONS, SOAPSTONE
CUTTERS DARDELET RIVET and MACHINE BOLTS DANDELET RIVET and WACHIN DRILL RODS EAVE TROUGH and FITTINGS EXPANDERS, FLUE FERRULES, COPPER FLANGES, BOILER and TANK FLOOR PLATES FLOOR PLATES
GALVANIZED SHEETS, BARS, BANDS
HANDLES, HAMMER
HEADS, TANK and FLANGE
HOISTS, HAND and POWER
HON, STAYBOLT
LUGS, BOILEN, TANK and SILO
MACHIRENY, HAND and POWER
MANHEAD PLATES and FITTINGS PAINT STICKS
PLATE STEEL, STANDARD QUALITIES
ABRASION RESISTING
CON-TEN and MAN-TEN
PLUGS, FLUE
RAILS and FITTINGS
REAMERS NEAMENS
SHAFTING
SHEETS
ABRASION RESISTING
ELECTRICAL
CORTEN and MAN-TEN
HOT ROLLED and UNIFORM BLUE HOT NOLLED AND UNIFORM BLUE WELLSVILLE POLISHED COLD ROLLED STAINLESS STEEL GALVANIZED AND GALVANNEALED LONG TERME CORRUGATED U-S-S COPPER STEEL PRING STEEL BARS AND SHEETS TAINLESS STEEL STAINLESS STEEL STRIP STEEL, CR and HR STRIP STEEL, CR and MR
TEES
TIRE, HOUND EDGE
TOOLS, HAND and POWER
for BOILER and IRON WORK
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NATIONAL STEEL CORPORATION

HEATING SYSTEMS For Low Cost Houses

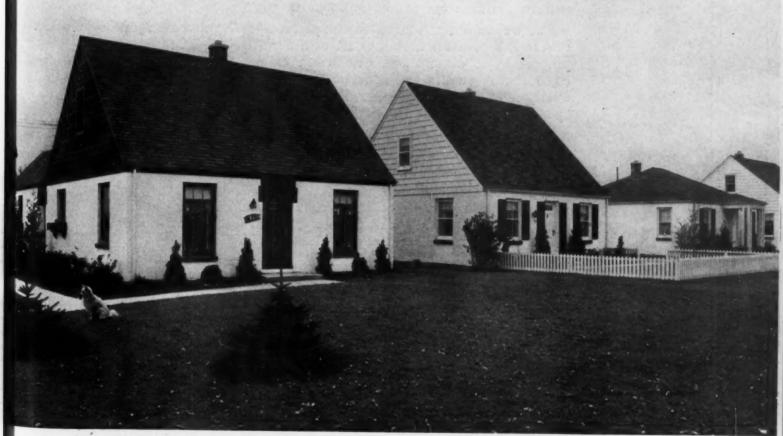


Photo by Portland Cement Association, Chicago.

The Problem of the Low Cost House

In THIS country there are 6,000,000 families with incomes above \$2,000 a year.

There are 19,000,000 families with incomes less than \$2,000 a year. This does not include relief families.

Economists tell us that a family ought not spend more than one and one-half to two annual incomes for a home. If this is good advice, we find the answer to—"Why the low cost house?"

Recent surveys and questionnaires by American Artisan to readers indicate that the \$2,500 house (Title 1, Class 3) is still "hard to build" in many, many localities due to wages, restrictions, saleability and so forth. But in practically every community builders are erecting houses selling for \$4,500 and under. That just about meets the two annual incomes formula.

To build any house, compromises are necessary. .But ruthless discarding of non-essentials is necessary in low cost houses.

The warm air heating industry is fortunate in that heat is essential and only in a few areas is heating and the heating plant viewed with indifference by the house prospect.

But we cannot afford to be complacent. We must recognize that in low priced houses the cost of the heating plant must be in proportion to other costs. We can't expect heating plants of \$6,000 house quality to be installed in \$3,000 houses. If this industry insists on that premise, low cost houses will be heated by "parlor heaters," floor furnaces, stoves, radiant heaters, etc.

Fortunately, our manufacturers have been aware of this need for some time and suitable equipment is available for all types of fuel, for any price of house.

What we need, we think, are ideas which eliminate every possible unnecessary pound of duct work, every unnecessary hour of shop and field labor. Ideas, probably, which discard old notions of essential design in favor of new ideas which reduce cost without sacrificing basic quality.

This section is an attempt to publicize these ideas. We have tried to include every plan which the Cost Analyses show place installed costs within the percentages commonly allotted for heating. We have included systems for coal, oil, gas. We have included ideas for both gravity and mechanical circulation. We have included systems ridicuously low priced and others which satisfy the home buyer who wants "air conditioning" and fewer knicknacks.

We have included ideas which show complete cooperation between builder and heating contractor to the end of giving the buyer the best possible heating system and ideas which satisfy the builder who considers heating a minor necessity and builds his houses with little thought to heating.

To the many, many contractors and manufacturers who have cooperated in gathering this data—our thanks.



"Elmwood" is a typical Rochester low cost house development. Houses sell for approximately \$4,500. The winter air conditioning systems (oil-fired) are installed for a flat \$295, a price which requires real organization to make any profit.

"Specialized Organization" Is the Key To University Heating Co.'s Low Cost Systems

In Rochester, New York, the University Heating Co. was organized in 1938 by William Shull, formerly with a General Electric dealer, for the sole purpose of working with building contractors on volume construction of low and medium priced houses.

What Builders Want

The firm believes that to work with building contractors it is necessary to be ready at a moment's notice to do any part of any job that the builder must have done to get his draw or inspection. This requires organization and trained men and material on hand to send to that job or any other job. When a builder wants wall stacks in a certain house at a certain time, he wants action. If the house isn't stacked, lathers are held up, construction lags, the heating contractor feels the pressure of rush work and confusion results.

Further, builders want good work; they want design which does not cause "kickbacks"; they want a responsible heating contractor willing to assume future service, and they want this service whether the development is one house or fifty.

Price, of course, is uppermost in every builder's mind, but he demands good equipment, design and service even though his price is low. The heating contractor must get his profit from many small, net profits, on many installations.

University Heating Co. is set up for this type

of operation. In addition to Mr. Shull there is Fred Baumbach, engineer, and ten workmen divided between service, sheet metal mechanics and helpers. These men have all been trained by the company for this type of work or have had from three to fifteen years of similar experience in the oil burner or sheet metal field.

26 Houses in One Group

Typical of the houses in the Rochester "low cost" field is the installation pictured. This is one of 26 houses in "Elmwood" started in October and completed in December. Mr. M. Sanford Abbey is the builder. These houses sell for \$4,650, considered "low-cost" in Rochester. The heating plant was installed for \$295 on the basis of a 26-system order. The cost breakdown is shown in the table.



University Heating Co., is not a pretentious establishment, but is equipped to do well the type of work it was organized to do—low-priced heating in low-cost houses.

COST ANALYSIS

Oil Burner ("Packaged Unit"\$1 Blower Controls Registers	49.00 10.50
	10.50
Registers	10.50
itchicus	
Sheet Metal Work (Prefabricated Cost).	43.20*
Installing all duct work	25.50*
Setting up unit, tank & wiring, etc	30.80*
Miscellaneous labor on job	6.00*
\$2	65.00
	30.00
26 Jobs taken at (each job)\$2	95.00

*(Average).

\$295 Installed Price

To install an oil burning, winter air conditioning system for \$295 required ingenuity. Co-operation was required between builder and heating contractor in order that the installation could be made for this price, but mostly the price was made possible through planning on the part of the heating contractor.

Job Foreman Is Key Man

Mr. Shull describes this planning graphically—"We appointed a job foreman who devoted his entire time to this 26-house development; to be on hand at all times to give service and keep the installations moving rapidly. The job foreman directed our workmen to do certain operations at the proper time. Of course, financial assistance was given by the builder to enable us to have materials on hand in large enough quantities to handle the work as needed.

"This 26-installation project has several distinct steps to the installation of each plant. Three distinct layouts were made. Each layout had the same number of openings and little difference in

Right is a typical oil-fired, winter air conditioning system, as installed for the Cost Analysis figures shown above. A minimum amount of duct work, all pipe work simplified as much as possible, plus organization which saves time and material is the answer

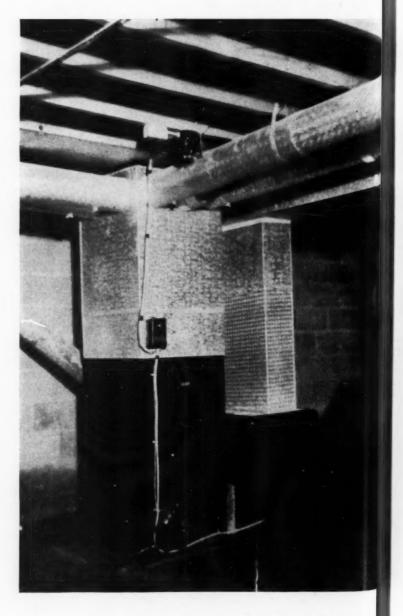
material quantities. A master layout was planned for each of the three layouts and this was used throughout.

Roughing In

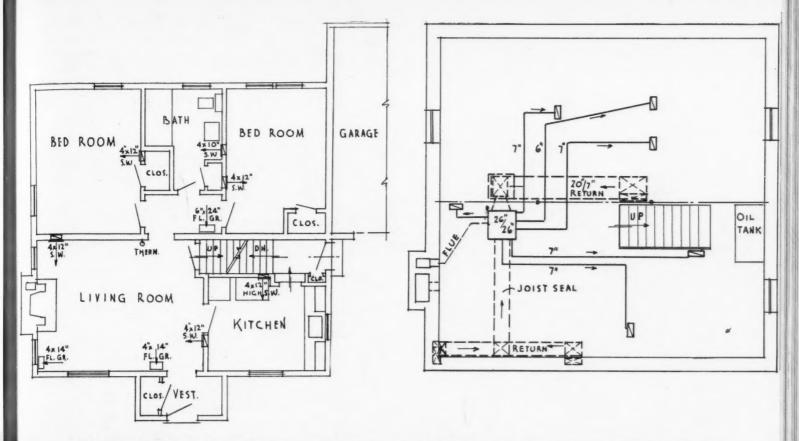
"The first step was to install the stacks and stack heads. This was done by the job foreman as soon as the house was roughed in. The second step was to provide temporary heat. This required setting the oil tank, running the oil line to the burner, setting the furnace in approximate location on cement blocks as the basement floor was not poured. The carpenter cut a hole about 2 feet square in the sub-flooring above the furnace. This heat supply was used to dry out the plaster. As soon as the basement floor was laid, we began step three.

Furnace, Controls, Ducts

"Step three required a sheet metal mechanic, a helper and an electrician. These men set the fur-



American Artisan, July, 1940 Low Cost House Heating Section



The installation shown on the facing page and itemized in the Cost Analysis is diagrammed above. Simplicity, without sacrifice of established principles, gives a highly satisfactory system for a little money. Builders express their satisfaction in letters,

nace, installed cold air and supply piping, wired the system for controls—everything but placing the opening faces. One day was required for this.

"All material items such as cold air ducts, plenums, warm air pipes and fittings were fabricated in our shop and delivered to the development for eight or ten jobs at a time. All sheet metal work were standardized to fit all jobs. The typical plan shows these items and the layout of the system.

Design of System

"As the plan shows, the cold air return is rectangular full piping or joist pans. Warm air pipes are all round pipe. We planned rectangular warm air pipes, but experience showed round pipe quicker and easier to install. Also, individual round pipes were lowest in cost due to the lesser number of sizes, tapers, transitions, etc. Also, individual round pipe could be fabricated in the shop and cut to fit on the job. By using 6 and 7-inch round pipe, elbows, boots, collars, the material items were greatly standardized.

"The builder, Mr. Abbey has been so pleased that he voluntarily commended our service, design and systems for low service cost and cost of operation. We can offer a builder gravity, coalfired, oil or gas furnaces, winter air conditioning, in simple or elaborate installation using reputable equipment. To this we are able to add a service

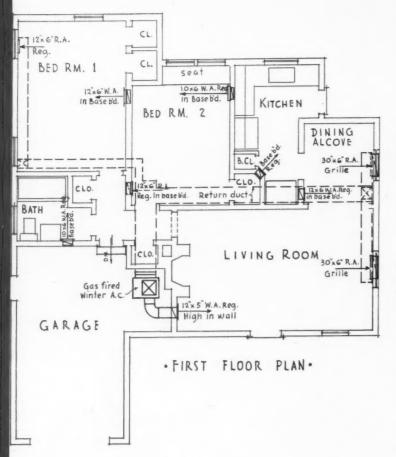
planned especially for the volume builder.

"In these Rochester houses much thought and planning was done to give the prospective buyer a quality house. Particular attention was given the heating system, since an oil-fired, winter air conditioning system was known to possess positive sales appeal to Rochester home buyers. To keep the selling price of the houses within approximately \$4,500 and still include winter air conditioning meant cooperative planning by both heating contractor and builder.

Installation Costs More Than Equipment

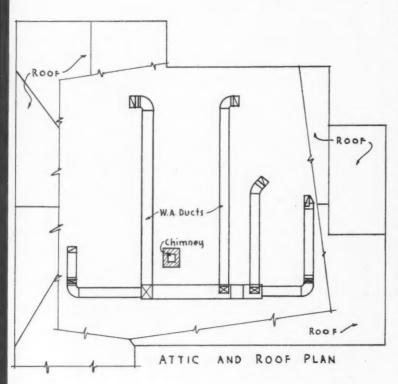
"The heating equipment, of course, had to be low in cost because we knew that installation, piping, labor, profit, etc., would cost more than equipment alone. With equipment cost established, the remainder of the cost had to be planned upon certain economies of time and material and is the reason for the type of plan finally selected.

"While the project described contains a large number of houses, the same plan can be applied to smaller groups of houses excepting that a single house or several houses remote from one another eliminate the savings possible where the delivery and mechanics can keep busy without lost time. This applies to shop work also. We cannot quote these prices on small projects."



Data Sheet

Heat Loss			Register		Individual Duct Size		
ROOM	BTU/hr.	CFM	FPM	Si	ze	& Rise	er
Living	17,040	183	700	12"x5"	H.W.	12"x3	89
Dining		87	300	12"x6"	B.B.	12"x31	2"
Kitchen	6,640	91	380	10"x6"	B.B.	10"x3	59
Bed Rm. No. 1	10,160	120	400	12"x6"	B.B.	12"x3	"
Bed Rm. No. 2	5,760	79	350	10"x6"	B.B.	10"x3	"
Bath	5,040	70	300	10"x6"	B.B.	10"x3	"
Total			49,00	O BTU .	+ 630	CFM	



First Floor Furnace, Attic Distribution, Baseboard Registers

Cost Analysis

Furnace (gas) Blower	} } "Packaged Unit"\$111.19
Controls	j rk (Shop Fabrication) 128 .18
	Work
	Electrical, Tax, Permit) 17.94

Note—Wage rate \$1.21 per hour including Unemployment Ins., O.A.B., Federal Tax.

THE Orton Heating Co., Akron, Ohio, installed the system diagrammed in a house which cost under \$3,000. In this case the builder made the gas-fired, winter air conditioning system a major sales feature of his house and allotted approximately 10 per cent of the cost price of the house for conditioning. The cost breakdown shows the items in the system.

The building is frame, without basement. To conserve space, the furnace was placed in a recess in the garage. A straight-up plenum feeds the warm air supply which runs through the attic. Return air is carried through a full metal duct suspended from the floor joists or panned joist spaces and enters the conditioner at the side (see plan).

H. L. Orton describes the features as—"The gas-fired conditioner has a 70,000 Btu input rating; 56,000 Btu output at the bonnet. The 9-inch blower delivers 700 cfm of 65 degree air against \(^1\)4-inch resistance.

"One branch for the living room is taken off the side of the plenum. This opens through the only high side wall register in the house. We designed the system as a modified, individual duct system using standardized ducts. The warm air main in the attic crosses the joists and is insulated with 1-inch of corrugated board strapped on. Branches are square pipe and taken off the bottom of the main and run between joists to stacks in partitions. Branches are insulated with the insulation used in the attic floor.

"Warm air registers are placed in the baseboard because our experience shows better results with baseboard locations."



Standard Code Gravity for Houses with Basements

M UCH publicity has been given the fact that leaving out a basement effects a very substantial reduction in low priced house cost. But in some localities home buyers insist on having a basement, publicity not withstanding. Such has been found the case in the Tri-Cities (Davenport, Ia., Moline and Rock Island, Ill.) so builders have had to include full basements and still keep house costs approximately at the \$25 per month payment basis.

Full basements make possible gravity warm air—time proven, low in installation cost, trouble free, familiar to every home buyer. Hand-fired coal operation is offered, but automatic firing can be added later.

The system and house illustrated are typical of low cost construction in the Tri-Cities.

The Cape Cod house with occasional variations is very popular. This style with two bedrooms on second floor at about \$4,000 to \$4,500 has sold well, always with basement and gravity heating plants. Occasionally forced air is used with and without automatic firing.

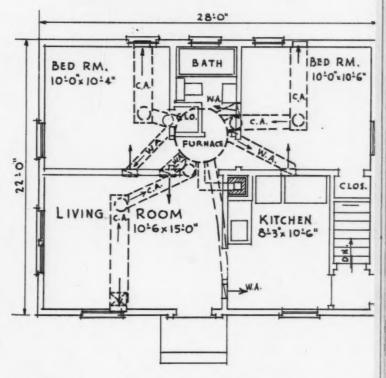
The house shown sells for \$3,100 on average monthly payments of \$25.00 and offers (see plan) two bedrooms, bath, kitchen, living room and the full basement. The structure is frame, concrete foundation, concrete basement floor; lot is usually 40 by 105 feet costing \$375 in a good neighborhood.

O. W. Schmidt & Son, Rock Island, installer of the system shown, supplied the cost analysis. The installation was designed according to the Standard Code as to sizes, but does not include some air flow pipe fittings for cost purposes.



Cost Analysis

Furnace (20-in, Cast Iron)\$	56.00
Registers (5 W. A.; 3 C. A.)	15.31
W. A. and C. A. Pipe (see text)	27.92
Installation Labor	24.00
\$1	23.23
Overhead and Profit	36.77
Selling Price\$1	60.00



Warm air pipes are tin, covered with asbestos paper; return air pipes are galvanized iron, no paper. Control is by manual chain and dial. Registers and returns are all in baseboards.





Exteriors of plans number 1 and 2 (see facing page) for Sioux City houses selling for \$2,800 with winter air conditioning. Frame exterior (shingles), concrete floor, no basement. Monthly payments \$21.00.

Most Popular Idea - Closet Furnaces With Ducts Behind a Furred Hall Ceiling

IN order to enable the average working man to own a home of his own, Mr. Theodore R. Graham, designer and builder of homes in Sioux City, Iowa, designed and built the low cost homes described herewith.

The basic plan is shown in plan No. 1 and the finished home is shown in a photograph. Several variations of this plan have been used, such as plan No. 2 which is also shown completed in a photograph.

Houses Sell For \$2,800

These homes are basementless. Consequently a better home has been built for \$2800, including the lot, with a monthly payment of \$21.00, as the cost otherwise needed for a basement has been put into the above ground structure. The homes, eight of which are now completed were built for private owners and were sold by Mr. Dan Conley of the Buckwalter Company of Sioux City, Iowa, under Title One of the F. H. A.

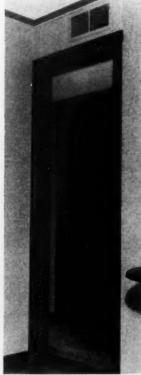
House Construction

The floors in these homes consist of four inches of concrete on the ground and on which is cemented oak block flooring. The construction is regular framing; the interior is finished in fibre panel; the exterior is shingles on sheathing with 50 lb. asphalt paper between. The roof is wood shingles. The interior of the garage, which adjoins the home, is plaster board.

The heating installation is forced warm air and

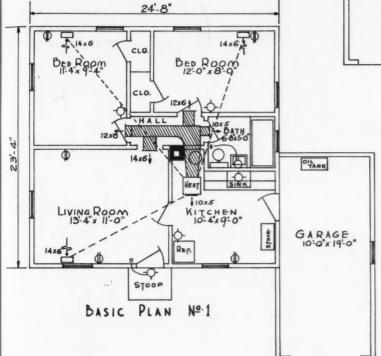
is working very efficiently. The heater is an oil fired, forced air winter air conditioner having a bonnet capacity of 70,000 Btu per hour using No.



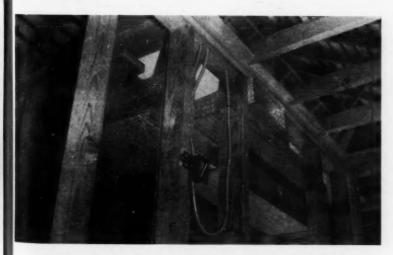


The oil-burning winter conditioner is placed in a narrow recess (see plans) and is open to the kitchen. The grille heats the kitchen. Warm air to other rooms is piped to registers which open above doorways (right) using directional flow registers.

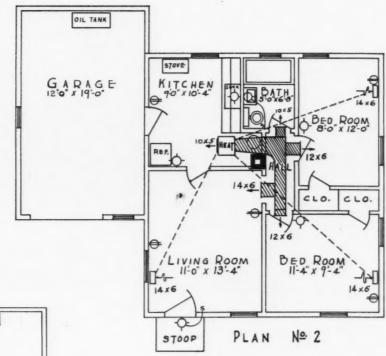
Ductwork in plans 1 and 2 are identical for size and dimensions of sections but are lefts and rights after assembly. In many such installations the complete ductwork can be assembled in the shop and hung as a unit. Return air is oval galvanized pipe encased in concrete.



2 fuel oil, or 54,600 Btu at the registers. The blower capacity is 1,000 cubic feet per minute. This is ample to take care of the houses which have a demand of 46,350 Btu per hour and 650 cubic feet per minute figured at -20° to 70° F.



View of duct sections after hanging in place and before walls and false ceiling were placed. Furnace at left. Note compactness of duct work required. This is for plan number 1, above.



The heater is placed in the kitchen as shown on the plans and in a photograph. The oil tank is in the garage and is elevated to give gravity feed to the oil burner.

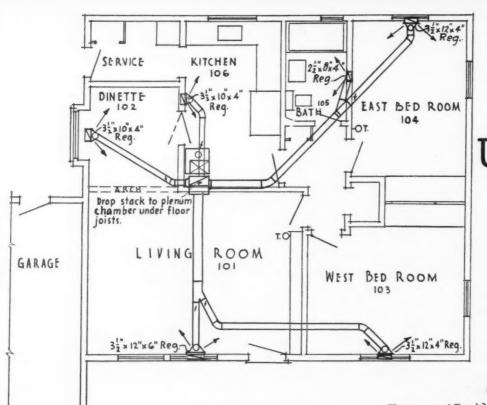
Ductwork, Registers, Returns

The warm air duct is only ten feet long and 7 inches deep as shown in the plans and photographs and is placed below the ceiling in the hall, a false ceiling being added later. In all variations of the basic plan the duct work is identical. The take off from the heater is 12 in. by 12 in. and changes to 7 in. by 22 in. when passing through the wall. After making the turn the size is reduced to 7 in. by 12 in.

The warm air registers are placed above the doors as shown in the photograph of a grille, which also shows the false ceiling. The kitchen register is in the plenum chamber (see unit picture). The return air faces are placed in the floor against the outside walls and the ducts, three in number and oval in shape, are encased in concrete under the cement floor, emptying into a pit 20 in. by 20 in. by 12 in. deep, over which the heater rests.

Reported Installed Price

These heating installations, including heater, warm air duct, register faces, labor, state sales tax and city permit, were made on a reported contract price of \$225.00 each and were installed by the Friend-Pike Sheet Metal and Roofing Co. of Sioux City, Iowa.



Registers Under Windows In a 10% System

In Beverly Hills, California, the Payne Furnace and Supply Co., contracting division, for some time has been advocating a central warm air system for small houses incorporating one feature recommended for larger houses—

To install this type of system it is necessary to take the warm air off the top of the unit, drop a stack down into a plenum chamber underneath the floor as shown in the details and pipe the air from this plenum to the windows through directly run round pipes as shown in the floor plan. This house sold for about \$3,000.

warm air supply under windows.

The builder must provide a combination furnace foundation of concrete piers as shown in a detail and openings through the piers for the warm air pipes from the metal plenum.

This system has a number of talking points. The heater closet or recess can be located anywhere, without regard for partitions or room arrangement. Special ceiling construction to hide ducts or use of closets, cupboards, etc., for pipe concealment is eliminated. The pipes pass through otherwise unused spaces (underneath the floor) for most of these houses have no basements, but are raised off the ground slightly for ventilation. No returns are used but grilles may be cut through partitions to give access to the heater.

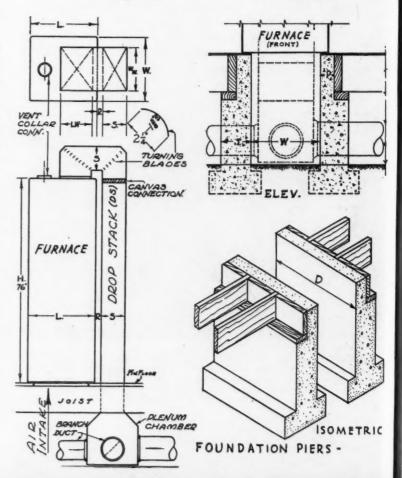
Payne stresses under-window warm air registers as ideal in getting gently rising curtains of warm air directly against the coldest surfaces—windows; making the usually coldest areas of a room (near windows and walls) as warm as inside walls; as a means of diluting infiltration at its source.

Cost Analysis

rnace (Gas))		
ower	}"Package Unit"		\$177.77
ontrols	j		
ipe and Fitti	ngs (Fab. and In	stall)	50.85
runk Line ar	nd Plenum		16.10
ir Cell Insula	ation (Applied).		5.20
ent Pipe (In	stalled)		9.10
-			
			\$307.77
	ower ontrols ipe and Fitti runk Line ar ir Cell Insule ent Pipe (Ir xtra Fitting	ontrols ipe and Fittings (Fab. and In runk Line and Plenum ir Cell Insulation (Applied). ent Pipe (Installed) xtra Fittings and Switch	ower \"Package Unit"

Less 10% for cash.....

Selling Price\$277.00



Service Room Furnace With Full Return System and Round Pipe Supply in Attic

Heating systems for low cost houses in the less severe climate regions of the country has been pretty well accepted as "the field" for floor furnaces, circulating heaters, radiant heaters and such. Notwithstanding, when an owner wants comfort, convenience and true conditioning, he turns to the central system. This installation is typical of the better class, central system, mild climate project.

PIEDMONT Sheet Metal Co., Winston-Salem, N. C., has faced the problem of installing central heating plants in low cost houses for some time. W. L. Rothrock, owner, reports that among the local builders the installed price is of paramount importance but seven to ten per cent of the cost price of the house is being allotted for winter air conditioning.

How Costs Are Reduced

"By substituting a utility room for the basement, costs are lowered about \$200. Where the builder cooperates with the heating contractor and provides a centrally located equipment room cost of duct work can be lowered \$60 to \$75. By furring ceilings and using closets for pipes, insulation on pipes is eliminated and reduces cost," reports Mr. Rothrock.

The plans show a typical Piedmont installation. The unit is an oil-fired, winter air conditioning furnace, placed in the service room. A straight-up plenum extends into the attic where individual, round-pipe branches run diagonally to partitions. Registers are seven feet above the floor. Warm air pipework is kept as short as possible.

Return System Is Not Skimped

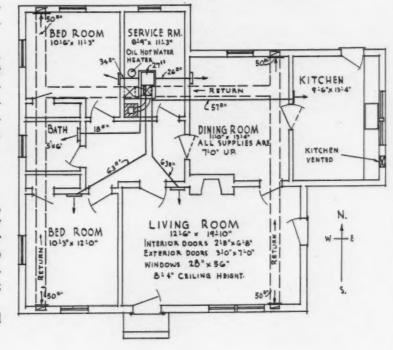
Outside wall return faces connect with a direct, all-round pipe return system from grilles to utility room. A rectangular return duct passes under the heater. Returns reach the furnace from two directions and one side passes beneath the furnace. A riser takes return air to top of the unit and turns down over the filters and blower.

Houses of this type and size are being sold currently for approximately \$3,100 to \$3,500.

Cost Analysis

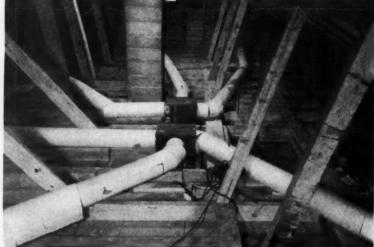
Furnace Oil Burner Blower Controls "Packageo Unit"\$	130.00
275 Gal. Tank	18.50
Registers and Grilles	9.00
Sheet Metal (Material)	20.40
Electric Wiring	4.95
Labor (Fabricating and Erection)	32.20
Incidentals	15.62
Total Cost	230.67
Job Sold for\$	

Attic supply from the furnace in a service room, coupled with full return system between floor and earth and high side wall registers describe this installation.



RIC





Left—The "parlor heater" may be enclosed in a tightly-fitting room as shown or may stand out in the most important room. Grilles are cut through the ceiling and the "Air Movers" are placed directly above in the attic. Above—"Air Movers" in place with round pipe supply insulated against heat loss. The owner (left) has placed a sheet of iron across the front opening further to form a warm air plenum.

By removing the top of the blower casing the unit can be used as an attic fan for summer ventilation and night air cooling.

Forced Air Distribution For Houses Equipped With "Parlor Heaters"

A PRACTICAL idea for improving "parlor heater" low-cost house heating systems is offered by dealers in Detroit and New England cities where "parlor heaters" of the gravity circulating type have been included or provided for by builders. The idea is equally adaptable to existing houses where these circulating heaters have been installed or to any part of the country.

The difficulty of "parlor heater" heating has been lack of temperature uniformity in all rooms. Seemingly, no matter how centrally located is the heater and no matter what enclosures or lack of enclosures are used, this lack of temperature uniformity exists.

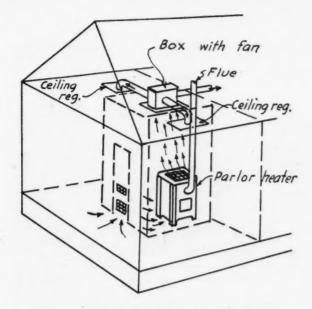
The idea illustrated requires that the heater be enclosed in a fairly tight fitting "heater room" which acts as a plenum chamber for rising warm air. This room is built up to the ceiling and the door provided with grilles for return air to the heater.

In the ceiling of the "heater room" a hole is cut above the heater and an "air mover" is mounted in the attic as shown in the diagrams. This "air mover" is the heart of the idea. The "air mover" is a packaged unit consisting of a twinwheel centrifugal blower with direct connected motor in a housing which contains the grille. Round pipe are run from the housing directly across the attic floor to ceiling registers which may be placed in the center of the room or toward outside walls (see plan).

Numerous variations are available. One large pipe can be taken off the housing and split into

Cost Analysis

0001 111141 9010	
Heater\$75 to	\$100.00
"Air Mover" (includes installation)	32.50
21 lengths, black pipe @ 18c ft	3.78
Six 6-in. Elbows @ 24c	1.44
Installation of duct work and cutting	3.00
(Rate \$1 per hour)	
Dampers (15c each)	.90
Insulation (3c per sq. ft.)	2.50
Total	\$144.12



Above—Diagram of typical enclosed installation. Right—Layout of piping system for house shown in the photographs. Many variations are possible. Registers are placed to direct warm air to cold surfaces. A baseboard return grille (not shown) was installed in living room partition at heater. Floors in linen and broom closets were raised 4 inches to permit free air return to heater. Dampers are installed in each supply pipe to regulate air delivery.

branches. Or individual round pipes can be run. Or, in larger houses, two "air movers" can be installed to accommodate more runs and larger air volume.

The blower unit can be started and stopped manually or automatically from a thermostat.

Our cost analysis shows typical prices in Detroit. New England reports costs of about \$3.50 per run of warm air pipe. Black stove pipe is used (about 18 cents per foot) and runs are seldom longer than 12 feet. The warm air registers come with the unit. In New England a 55 gal. oil drum is permitted in some localities,

Exterior of house described and living room showing one of the ceiling registers and a return grille to the heater enclosure just inside the wall.



American Artisan, July, 1940 Low Cost House Heating Section

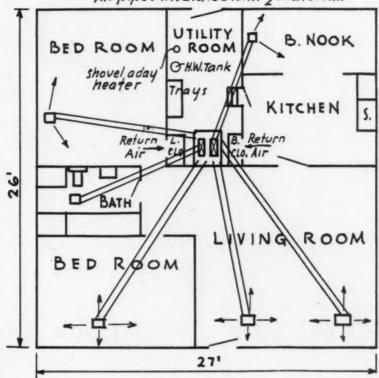
∠ Legend
 ∠ Air movers.

- Registers in ceiling.

- Return air grilles under closet floor.

- space heater.

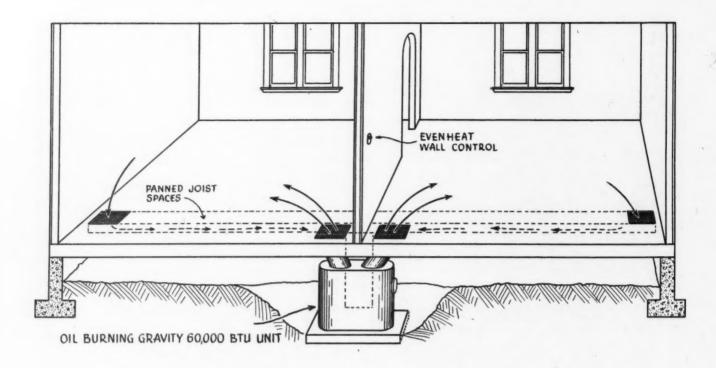
All pipes insulated with 1 materials



further reducing cost. Ducts in attics are insulated. New England also declares "parlor heater" prices to be \$65 to \$90.

Another variation places the heater in one room, exposed, to heat that room by radiant heat and takes rising warm air through the grille and "air mover" to other remote rooms. This eliminates a heater enclosure.





Oil fired, Gravity for the house with

No Basement and No Service Room

Cost Analysis

The same of the sa	
rurnace	@ 45 00
Furnace \(\) Oil Burner\(\)	φ 40.00
Registers and Grilles (4)	5.30
Pipes, Duct Material (Material)	4.60
Labor Installing Ductwork	3.00
Setting Furnace	2.40
Profit and Overhead	30.00
Misc. (Permit, Wiring, Tank)	16.25
Total	\$106.55

ASUGGESTION for low cost house heating closely paralleling the "parlor heater" in installed cost is shown in the diagram. This idea and equipment has been used by Del Loeffler, Detroit heating contractor in several of the low cost house developments around Detroit, where gas is not available or feasible.

This gravity type oil-burning heater is built of materials and to standards of full sized oil furnaces. It is, however, designed especially for location under the floor in a pit or basement instead of in living rooms. The equipment can be installed for a price well within five per cent of the cost price of the smallest house.

As the diagram shows, heat is delivered by gravity flow to two registers which can be located for best circulation. Air is returned to the heater through two grilles, also located for best results. This provides a completely closed system with all the advantages of a gravity furnace, plus the convenience of automatic firing. If necessary, more than two warm air leaders may be run. Oil for the burner is stored in an outside tank with gravity feed from tank to burner.

For protection against rusting, and deterioration the furnace body, inside and outside, is coated with a special fused-on porcelain nickel ground coat.

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In selecting the motor for air conditioning equipment it is important that you select the right type of motor—a motor exactly suited for the job. That is why Wagner builds such a wide variety of motors . . . to make it possible to select the RIGHT motor regardless of the speed, torque, or current characteristics involved.

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Wagner Electric Corporation

6400 Plymouth Avenue, Saint Louis, Mo., U.S.A.

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In order to properly select a motor to drive any part of the equipment of an air-conditioning plant, the following points should be considered along with the first cost and maintenance.

What maximum and minimum horsepower is involved, and what is the probable duration of each?

What are the maximum starting torque requirements?

Is the duty cycle continuous or intermittent, and what method of control and overload protection is contemplated?

Power Supply

A.C. or D.C., and frequency if A.C.

Phase

Special starting current limita-tions, if any, imposed by the power supplier.

Speed Characteristics

Single constant speed. Variable or multispeed

Mechanical Construction

Is open type motor acceptable, or should Splash proof,
Totally-enclosed fan-cooled, or Explosion-proof motor be used?



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Firm City. State



The new No. 411 Thermostat retains all the basic advantages of the No. 211 which it now replaces. These advantages have been proved successful by thousands of installations of the earlier model.

New ideas, however, are being used in the new Thermostat which will improve even the famed service and dependability of the earlier No. 211. Some of these important advantages are:

- * Accurately leveled temperature control by means of a patented, adjustable compensating heater (commonly known as a "pre-heater"). This eliminates costly overheating and minimizes "cold 70".
 - *IT IS NOT NECESSARY TO CHANGE HEATER ELEMENTS!

 The heater is in parallel with the load so that one Thermostat handles all jobs. And if it becomes necessary to vary the heater effect because of unusual conditions, even this can be done without changing heaters—by merely readjusting its location with the turn of a screw driver.
 - * New and improved range adjusting wheel—easier to read and set. Setting can be locked to prevent tampering.
 - ★ Separate mounting plate simplifies installation and wiring.

★ Pleasing appearance and design—harmonizes with any interior.

A New Day and Night Thermostat in the 411 Series Too!

The No. 411 Day and Night Thermostat uses a small resistance heater beneath the cover. When energized at night it reduces the effective operating point approximately 8° below the Thermostat setting. This simplifies construction of the Thermostat and reduces its cost correspondingly.

The resistance heater has a manual switch which enables the user to disconnect the heater at night when desired. The heater and switch can be added to a standard 411 Thermostat RIGHT ON THE JOB.

The No. 411 uses a separate Clock Switch—the No. 456. The Clock can be installed in the kitchen, closet or basement and kept out of the living quarters.

For further particulars send for our Bulletin No. 193. You can get "Genuine Detroit" Automatic Controls and Heating Accessories from your wholesaler.



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BOOKKEEPING-

By Joseph G. Dingle C. P. A., Ottawa, III.

Article I of this series (June issue) sought an explanation of why the average business man refuses to learn the terminology of bookkeeping and shows little interest in an understanding of bookkeeping principles. This article explains why bookkeeping is important and just what bookkeeping seeks to do in the average place of business. The series will present a complete bookkeeping system with all necessary forms, journals, cards, and apply this system to a furnace-sheet metal business of average size.

ONE usually looks in the dictionary for the meaning of an unfamiliar word but for fear you do not have one handy, we will quote here the definition of the term:

"BOOKKEEPING—The art or practice of keeping a systematic record of business transactions, so as to show their relation to each other, and the state of the business in which they occur."

Here, in simple, concise language, in words of every day use, we find the best definition of the subject of this discussion. Bookkeeping is a systematic record of business transactions. While we do not wish to attempt a clearer, more concise definition of bookkeeping, we do feel that perhaps we can help fit this definition to your conception of business. Or shall we say, attempt to give you our conception of business in order that you may better fit bookkeeping and your business into a complete unit. They go together—neither can be of value without the other.

What Is a Business?

Before getting into bookkeeping, let's arrive at a common understanding of business. You, as a reader of the ARTISAN, must be a business man, but can you tell us just what business is? You may say you have a shop, properly equipped to turn out the class of work you claim to be qualified to do. You may have some very capable employes, and a good supply of the raw materials of your trade. All this is fine, but unless and until a customer comes along your shop cannot function. You must have a job to do. Expenses of all kinds begin to eat into your pocketbook the very day you rent a shop, preparatory to equipping it and, as you well know, these expenses

continue even after the sheriff has tacked his notice on the door. Customers are the necessary, lifegiving feature of any business.

With customers your business may, or may not function properly. You may have a few customers, yet not enough volume to utilize the facilities of your shop and, in this case, you can not operate to the best advantage. Your overhead will be out of proportion to your sales volume, thereby consuming your profit. On the other hand, you may have all the business you can possibly take care of, and yet lose money. If you are not recovering through your sales price the whole cost of the product sold, you can, and will, lose money. Again, you may be deliberately figuring your selling price at a close margin, losing money for a while, in an effort to so increase your volume that, at the same price, you can make real profits-through spreading your overhead over a large volume. Shop rent of \$100.00 per month is equal to 10% of \$1,000.00 monthly sales, 5% on \$2,000.00 monthly sales, or 2% on \$5,000.00 monthly sales.

Business Is a Mixing Process

A business, any business, may be compared with a huge mixing bowl into which is dumped many ingredients, some seen and many unseen, and out of which emerges a usable or salable article. A farmer, in his business, mixes land, implements, labor, taxes, insurance, gasoline and many other things, including, seed, and produces corn, wheat, oats or hay. He may then continue the mixing process and feed that corn to range cattle or small pigs and finally produce finished beef, cattle and hogs. The miller may take the wheat, mix it thoroughly with his mill, which is

composed of buildings, machinery, labor, and expenses too numerous to mention here, and the result will be flour. Business, then, is a huge mixing bowl into which is dumped all kinds of ingredients, and out of which comes completed and usable articles.

Processing Adds Value

Each step in the mixing process costs money and, if properly done, adds value to the ingredients. Let's illustrate this with some fire clay. In place in the earth it is practically worthless, just mud. It is such poor land it will not produce a crop of anything but weeds. A brick manufacturer takes this clay, processes it preparatory to making face brick which may, when finished, sell for, say \$50.00 per thousand. After crushing and grinding this clay, but before it reaches the brick making stage, a jug manufacturer comes along and buys a few tons of this processed clay. He takes it to his plant, further refines it preparatory to making jugs, but before he has completed his jug, along comes a sculptor, who buys a bag or two of this refined clay. Instead of paying a few cents per ton, as did the brick manufacturer, or a few dimes per ton, as did the jug maker, the sculptor probably paid a cent a pound for his clay. After modelling some object, the clay finally is fired, not as a brick, nor as a jug, but is an object of art. Instead of being worth a few cents a pound as a face brick, or a few dimes a pound as a jug, it is worth tens of dollars per pound as an art object. Each step towards its final form increased its value in proportion to the cost of the effort or expense applied to it.

Business is an active thing. Once set in motion, it is forever consuming value, whether it produces value or not. Even after all employes are off the pay roll, rent, taxes, insurance, and many other costs continue. This never ending consumption of value through expenses must be recognized and recovered in the price of the product produced, or it must come out of the business man's pocket.

Business is a romantic thing. Just as the composer sets down on paper his music, in order that any one who reads may reproduce his harmony, so does the boot black give of his efforts and polish that the customer's shoes may shine. The business man who fully appreciates the romance of his business can not fail to give more to his customers.

What Is Bookkeeping?

Now that we have painted a picture of business, let's try to paint the companion picture of bookkeeping. As we have said, neither can fully succeed without the other. We know that bookkeeping is the art or practice of keeping a sys-

tematic record of business transactions. As the mixing process of business proceeds, the book-keeper must record the moving of value, evidenced by the materials, wages, expenses, step by step along the line of production to the final completed article, in order that its cost may be determined, and recovered in the selling price. In principle, bookkeeping is the same in every kind of business, but in practice it is quite a different proposition.

A bank, for instance, handles only money, and charges a rent for its use. A retail merchant buys his goods at wholesale, marks up the price to include overhead and profit and sells the goods in the identical condition they were when he acquired them. The manufacturer buys raw materials, processes them into some other form or use and in so doing he incurs many kinds of expenses, seen and unseen.

Bookkeeping Is a Figure "Picture"

In each case, bookkeeping is the practice of so recording these transactions as to produce a word and figure picture which shows in detail the cost of the product in its several parts. Management, by using this cost data, can intelligently price the product, also can determine the steps or stages where excessive costs are and endeavor to control them. We will, in a later article, discuss in detail the cost elements in a heating and ventilating shop, but here we want to stress the importance of bookkeeping in any business.

After determining the cost of an article, book-keeping continues to safeguard that article. It records its cost, its sale, and through proper records holds the charge against the customer until paid. It then shows the money going through the bank to the payment of some creditor, some employe or some expense. In other words, the books show the state of the business as well as the relation of each transaction to the other.

Bookkeeper Must Have "Tools"

When you, as a business man, fully appreciate the complexity of your business, and the never ending stream of transactions, each pertaining to the moving of money or value from place to place, you will have a better understanding of bookkeeping. You will have a better understanding of the complex duties of your bookkeeper. If you have fully studied our first article you have probably come to agree with us that your bookkeeper is one of the most important members of your organization. But without proper tools, your bookkeeper can not render full service. You would not hire a mechanic and expect him to produce efficiently without proper tools. Your book-

(Continued on Page 118)

Pennsylvania's State Convention

THE Sheet Metal and Roofing Contractors Association of Pennsylvania held their 1940 annual convention June 13 and 14 in Harrisburg, the chief concern of the assembly being ways and means of obtaining an increasing membership in the group. Some increase in membership was obtained since the 1939 meeting, and an effort will be made to secure wider representation and more members in key cities throughout the state.

Tin Roofing

John H. Follansbee, Follansbee Brothers Co., speaking on "Tin Roofing" called attention to several common misunderstandings such as a recent statement by Ripley ("Believe It or Not") that tin sheets are not plates of tin, but plates of iron covered with tin whereas, in reality, tin plate is sheets of steel, not iron, covered with tin.

Mr. Follansbee suggested that an effort be made to tell the public that tin roofing has no resemblance to common tin, such as tin cans, which contain only one third to one tenth the protective coating that is put on Terne roofing. Further, today, the usual terne roofing consists of a steel sheet with a percentage of copper added to give longer life and resistance to the elements, coated with an alloy of "terne mixture" which is one fourth to three fourths lead.

The easiest way to apply terne roofing, declared the speaker used to be with factory made rolls, produced by lock-seaming 7 by 10, 14 by 20 or 20 by 28-inch sheets together into rolls 50 feet or longer. Seams were generally, but not always, soldered. This short roll terne roofing from sheets 96 inches long was pioneered by Follansbee and materially reduced the number of cross seams. This development has been followed by experimental work in the continuous coating of terne metal on long strips and Follansbee has succeeded in combining terne coating experience with modern cold strip rolling and electro-cleaning methods.

Seamless Tin in Rolls

Terne roofing in rolls without seams is produced by cold reducing hot rolled, copper bearing steel of the required gauge and grain structure to give maximum ductility after annealing. Coils are annealed dead soft, cooled and then temper rolled to the exact stiffness required. The annealed strip is passed first through a high-powered water-spray scrubber, then is electrolytically cleaned after which a water and brush scrubber removes all saponified oil and the strip is slit into strips with square edges, levelled and cut into rolls of 50 or 100 feet.

After pickling the coils are flushed, washed and soaked to remove all acid and pass into a flux bath and into hot terne metal—through a special coating machine and oil bath—are cooled, processed, cleaned, inspected, levelled again and coiled. After stamping and branding for grade and weight, the strips are painted on one or two sides and rolled for shipment.

Mr. Follansbee declared that despite long service, tin roofing is not as popular as it should be because manufacturers, jobbers and sheet metal contractors have been too modest and conservative in claims and have permitted less serviceable materials to capture much of the market. More aggressive selling is needed in order that the architectural attractiveness, long life, low maintenance cost of terne roofing may be thoroughly appreciated.

The afternoon of the first day was given over to reports of the Vocational Education, Trade Relation and Policy, Legislative and Membership committees and to a colored film on steel making by Carnegie-Illinois Steel Co.

Fabricating Duct Systems

J. H. Van Alsburg, Hart and Cooley Mfg. Co., spoke extemporaneously on Correct and Incorrect Methods of Fabricating and Installing Duct Systems and pointed out the effect of duct section, duct construction, angles, elbows and fittings on air flow characteristics of ductwork. The problem, said the speaker, is to keep resistance within the duct work as low as possible and keep air flow as uniform throughout all sections as possible.

Air Distribution

Herbert K. Kunen, Anemostat Corp., spoke on the necessary requirements for good air distribution such as—1: Air should be delivered to a room in various streams moving at angles to each other because several streams will allow for a more intimate contact between the supply air and room air and their angularity will prevent their merging as normally takes place when air streams move into a room parallel to each other.

Two: The supply air should be expanded as it moves through the air diffuser before getting

(Continued on page 110)

The COBLEM CORNER

Leaking Roof Seams

American Artisan:

We enclose a photograph of a 148 by 228-foot field house on which we placed a double standing seam, double lock, cross seam roof. Now the roof is leaking. It seems as though there is such a suction inside the building that water is drawn through the seams. Particularly bad areas are the top of the arch which is nearly flat. There is no paper



between the metal and the sheathing as the specifications did not call for paper. There accumulates such a volume of water on the roof that before the water gets over the edge there may be one inch of water standing behind the seams. We have tried cementing these seams. This has helped some, but we are not sure we are using the proper kind of cement. Should cementing be permanent? Is cementing the proper thing to do?

C. R. W., Minnesota.

Reply by The Editors

In answer to your problem on the field house roof which is leaking, we ourselves have not had this particular type of problem presented and accordingly we have telephoned various sheet metal and roofing contractors in Chicago and asked for their opinion of the most feasible procedure you can now follow.

All of these contractors agree that your first mistake was to overlook the importance of a 30-pound asphalt paper underneath the metal. This paper would have eliminated any suction effect if such actually exists. However, since the roof is on, there seems to be nothing you can do about the paper. You do not say whether the roof is galvanized iron or copper, nor how far apart the standing seams are, but from the picture, we judge that the standing seams are approximately two feet apart and if these standing seams are built according to standard practice and are approximately 1 inch high, there should be sufficient provision for expansion and contraction the long dimension of the building to prevent any cracking in the metal. If this is not the case, you may have to install four or five expansion joints from ridge to eave.

The concensus of opinion is that you should solder all of the double lock horizontal seams on that portion of the roof which is approximately flat, or on the part where the water stands or from the picture down as far as the lower row of sky lights. Caulking or cementing these cross seams will not be satisfactory in the opinion of the contractors consulted, because under your climate the cement will likely dry and harden and crack, thus causing future water penetration.

The standing seams can be soldered if the last turn in the metal is such that you can do a soldering job on the standing seam. This probably will be rather difficult and if it

seems too costly or impossible, the next best procedure would be to caulk the standing seams with carefully applied elastic roofing cement, being sure that the cement is worked well into the last turn of the metal.

We assume that your horizontal seams are laid correctly and that the crack of the seam points down the roof and not upward to catch water.

No one of the contractors consulted recommended cementing or caulking the horizontal seams for the reasons given above.

Painting Asbestos Paper

American Artisan:

In your December, 1939, issue, a question asked by one of your subscribers dealt with the method of painting asbestos paper that has been applied on warm air ducts. Your answer did not only fail to provide the proper reply to this question, but was derogatory to the use of asbestos paper for the protection of metal ducts.

The information given in your answer undoubtedly was based on the University of Illinois tests on the relative efficiency of asbestos paper as a conductor of heat compared with the bright reflective surface of new galvanized or highly tinned pipes. Your interpretation of these efficiency tests did not provide the home owner with all of the facts so that he may be aware of the merits of asbestos paper and the several reasons why it is used so extensively in the warm air heating industry.

The efficiency tests made by the University of Illinois compared the conductivity of one layer of asbestos paper with a brightly tinned metal surface, possibly only on a new pipe. After a year or so in service in a dusty, humid cellar, the pipe is dirty and the surface corroded. The bright reflective surface has disappeared, therefore, the emissivity factor completely changed. If conductivity tests were made on such a pipe after it had been in service, the value of the asbestos paper would be recognized.

However, asbestos paper is not only applied on warm air ducts for the purpose of insulation. Asbestos paper is valuable from the standpoint of increasing the service of the metal pipe as it deters corrosion and gives the pipe years of additional service. Furthermore, asbestos paper assists in sealing up joints, as well as covering up any holes in the pipe that might develop due to corrosion during the span of years that it is in service.

Asbestos paper also provides a protection against burns should anyone come in contact with the usually low hanging pipes that are in the basement. It also adds a fire-protection feature when these pipes are run quite close to wooden floor joists.

Lastly, asbestos paper is applied for the very reason that your questioner has found the material valuable—as a means of decorating his basement. Rusty, dirty pipes can be greatly improved in appearance by wrapping them with asbestos paper and painting them according to the color scheme that might be desired. This is very easily done by, first, giving the asbestos paper a sizing with an ordinary glue size and after drying using lead and oil or aluminum paint. If glue sizing is not available, it is satisfactory to use the two coats of lead and oil paint, the first coat filling up the pores and cutting down the natural absorption of the asbestos paper and the second acting as the finish.

J. M. HIGH, The Ruberoid Co., New York City.

N. W. a. H. & a. C. Ass'n Notes

GLAN AIR

WHEN many of the members of the Warm Air Heating Industry were in their "teens" an organization and a "plan" were developed by the industry's pioneers to insure the advancement of our comfort giving, peaceful industry. In comparatively few industries have the beneficient results of long range planning and organization been so conspicuous.

As a result of the Research and Engineering Program of the National War Air Heating and Air Conditioning Association in cooperation with the University of Illinois, the products of our industry have, for quite a number of years, found their way into

the most expensive homes. Prior to the 30's the acceptance of our products in the new home field was confined to low cost bracket homes.

And now we want to introduce you to the manufacturer members of our industry who have so liberally and for so many years contributed financially and in time and effort to the broad Research and Engineering and other programs of the Association. They are your first line of defense. For twenty-five years they have held that line and will continue to hold and advance it with your support. Check the list!

MANUFACTURER MEMBERS

of the

NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION

AGRICOLA FURNACE CO. Gadsden, Alabama AIR CONTROLS, INC. Cleveland, Ohio AMERICAN AIR FILTER COMPANY, INC. Louisville, Kentucky AMERICAN FOUNDRY & **FURNACE COMPANY** Bloomington, Illinois AMERICAN FURNACE CO. St. Louis, Missouri AMERICAN RADIATOR & STANDARD SANITARY CORPORATION New York City AMERICAN ROLLING MILL CO. Middletown, Ohio APOLLO STEEL CO. Apollo, Pa. ARMSTRONG COMPANY Detroit, Michigan ARMSTRONG FURNACE CO. Columbus, Ohio AUER REGISTER COMPANY Cleveland, Ohio AUTOMATIC HUMIDIFIER COMPANY Cedar Falls, lowe BASTIAN-MORLEY CO., INC. La Porte, Indiana A. G. BRAUER SUPPLY CO. St. Louis, Missouri BRUNDAGE COMPANY Kalamazoo, Michigan CARNEGIE-ILLINOIS STEEL CO. Pittsburgh, Pa.
CHAMPION FURNACE PIPE COMPANY Peoria, Illinos CONTROLAIR, INC. Elyria, Ohio COOK ELECTRIC CO. Chicago, Illinois CRISE ELECTRIC MFG. CO.
Mt. Vernon, Ohio
DOWAGIAC STEEL FURNACE CO. Dowagiac, Michigan GEORGE EVANS CORP. Moline, Illinois

Cleveland, Ohio FURBLO COMPANY Hermansville, Mich. GENERAL STEEL WARES, LTD. Toronto, Ont., Can.
GREEN FOUNDRY & FURNACE Des Moines, Iowa HALL-NEAL FURNACE CO. Indianapolis, Indiana HART & COOLEY MFG. CO. Chicago, Illinois HENRY FURNACE & FOUNDRY CO. Cleveland, Ohio HERSHEY MACH. & FDRY. CO. Manheim, Pa. HOME FURNACE CO. Holland, Michigan INDEPENDENT REGISTER COMPANY Cleveland, Ohio INTERNATIONAL HEATER COMPANY Utica, New York IRON FIREMAN MFG. CO. Cleveland, Ohio KEITH FURNACE CO. Des Moines, Iowa LACLEDE-CHRISTY CLAY PRODUCTS CO. St. Louis, Missouri LAMNECK PRODUCTS, INC. Columbus, Ohio LAU BLOWER COMPANY Dayton, Ohio LENNOX FURNACE CO. Syracuse, New York LIBERTY FOUNDRY CO. St. Louis, Missouri MAID-O'-MIST, INC. Chicago, III.
MAJESTIC COMPANY Huntington, Indiana MARION FURNACE CO. Detroit, Michigan MARSHALL FURNACE CO. Marshall, Mich. MAY-FIEBEGER CO. Newark, Ohio MAYFLOWER-AIR CONDITIONERS, INC. St. Paul, Minnesota

FAULTLESS HEATER CORP. Cleveland, Ohio FOREST CITY FOUNDRIES

COMPANY

McLOUTH AIR.
CONDITIONING CORP. Lansing, Michigan MERCOID CORPORATION Chicago, Illinois F. MEYER & BRO. CO. Peoria, Illinois MEYER FURNACE CO. Peoria, Illinois MICHIGAN TANK & FURNACE CORP. Detroit, Michigan MILCOR STEEL COMPANY Milwaukee, Wisconsin MINNEAPOLIS-HONEYWELL REGULATOR CO. Minneapolis, Minn. MONMOUTH PROD. CO. Cleveland, Ohio MONTAG STOVE & FURNACE WORKS Portland, Oregon MORRISON PRODUCTS, INC. Cleveland, Ohio MT. VERNON FURNACE & MFG. CO. Mt. Vernon, Illinois L. J. MUELLER FURNACE COMPANY Milwaukee, Wisconsin NILES ROLLING MILL CO. Niles, Ohio NORTHWESTERN STOVE REPAIR COMPANY Chicago, Illinois C. A. OLSEN MFG. CO. Elyria, Ohio OWENS-CORNING FIBERGLAS CORP. Toledo, Ohio PAYNE FURNACE & SUPPLY CO., INC.
Beverly Hills, Calif.
PECORA PAINT COMPANY Philadelphia, Pa. PEERLESS FOUNDRY CO. Indianapolis, Indiana PENN ELECTRIC SWITCH COMPANY Goshen, Indiana
PERFEX CORPORATION Milwaukee, Wisconsin PHILLIPS & BUTTORFF MFG. CO. Nashville, Tennessee PREMIER FURNACE CO. Dowagiac, Michigan

Quincy, Illinois RANDALL GRAPHITE PRODUCTS CORP. Chicago, III. REPUBLIC STEEL CORP. Cleveland, Ohio RESEARCH PRODUCTS CORP. Madison, Wis.
ROBINSON FURNACE CO. Chicago, Illinois ROCK ISLAND REGISTER COMPANY Rock Island, Illinois ROUND OAK COMPANY Dowagiac, Michigan RYBOLT HEATER CO. Ashland, Ohio ST. LOUIS FURNACE MANUFACTURING CO. St. Louis, Missouri SCHILL MFG. CO. Crestline, Ohio
SCHWAB FURNACE & MANUFACTURING CO. Cedar Grove, Wis. SCHWITZER-CUMMINS CO. Indianapolis, Indiana SLOSS-SHEFFIELD STEEL & IRON CO. Birmingham, Ala.
UNITED TATES RADIATOR CORPORATION Detroit, Michigan
UNITED STATES REGISTER COMPANY Battle Creek, Mich. UNIVERSAL COOLER CORP. Detroit, Michigan
VIKING AIR CONDITIONING CORPORATION Cleveland, Ohio WATERLOO REGISTER CO. WATERMAN-WATERBURY COMPANY Minneapolis, Minn. WEIRTON STEEL CO. Cincinnati Ohio WHITE-RODGERS ELECTRIC COMPANY St. Louis, Missouri WILLIAMSON HEATER CO. Cincinnati, Ohio WISE FURNACE COMPANY Akron, Ohio

QUINCY STOVE MFG. CO.

FARQUAHAR FURNACE CO.

Wilmington, Ohio FARRIS FURNACE CO.

Springfield, Illinois

ssociation

National

The place and date of the next meeting of the National Warm Air and Heating and Air Conditioning Association will be Detroit, Michigan, on December 9, 10 and 11, 1940.

Plans have already been started to make it another great occasion for the association and the industry.

Allen W. Williams Resigns

Twenty-seven years of service as the Managing Director and Treasurer of the National Warm Air Heating and Air Conditioning Association were completed in July by Allen W. Williams, when he retired voluntarily to take things a little easier from now on.

Mr. Williams along with a number of other well-known men in the heating industry back in 1914, when the first big European war was just getting under way, was one of the founders of what is now the National Warm Air Heating and Air Conditioning Association.

Mr. Williams was very anxious to assist in forming the group, but was not as anxious to be an officer. Nor did he think at the time that it would develop into a nation-wide organization with more than 100 manufacturing members, representing about 85 per cent of production in the field.

But the cards were stacked against Mr. Williams and the founders lost no time in naming him as a member of the board of directors as the managing director and treasurer.

In giving up his post Mr. Williams, however, is not severing his connection with the organization. He will continue in an advisory capacity, giving what advice and suggestion he can, if and whenever needed.

Mr. Williams also continues as secretary and treasurer of the National Warm Air Register Manufacturers Institute, a position he has held for many years.

Mr. Williams is to be succeeded as secretary and treasurer of the National Warm Air Heating and Air Conditioning Association by George Boeddener who has been serving the same organization for some time as Assistant to the President.

Cleveland NWAH&ACA Group

The Cleveland group of the National Warm Air Heating & Air Conditioning Association held their first golf meet of the season at Hawthorne Valley Country Club near Cleveland, June 25, with Messrs. H. S. Sharp of Henry Furnace and Foundry Co., W. R. Moore and F. E. Snowberg of Minneapolis-Honeywell Heat Regulator, as

In spite of hail and drenching rains 19 hardy souls played the sporty layout. Members were present from Ashland and Canton.

At dinner, H. S. Sharp, Vice-President of the N. W. A. H. & A. C. A. acted as toastmaster and introduced President C. E. Olsen, who gave a report on the activities of the National Association and pleaded for the whole-hearted support of all the members. W. R. Moore of Minneapolis-Honeywell outlined the reasons for the efforts of the Cleveland Group and cited the need for cooperative effort within the industry. C. E. Wilcox of Grant Totten, Inc., Canton wholesalers,

presented the wholesalers' views on industry problems.

Jack Farrell of Milcor Steel Co., Canton, was the first prize winner for low gross and won the first leg on the R. A. Jack Trophy. A. Galaba of Morrison Products, Inc., won golf balls for having the least number of putts. Blind Bogey was won by A. H. Loranger and S. D. Yardley of Republic Steel Corp. Second prize in Blind Bogey was won by J. E. Maynard of A. R. & S. S. Corp. C. E. Wilcox and E. D. Wolaver, won golf balls for high gross and A. L. Rybolt of Rybolt Heater Co. won a golf ball for second

George Auer of Auer Register Co., Treasurer of the local group, was in charge of arrangements and was complimented for the efficient way in which the tournament was handled.

It was decided to hold another meet sometime in August and Messrs. Steenrod and Farrell of Milcor Steel Co., Canton, invited the Group to hold the September meet at Congress Lake Club in Canton and the invitation was unanimously accepted.

R. A. Jack.

Nebraska

The Nebraska Sheet Metal, Roofing, Heating and Air Conditioning Contractors Association has recently been organized at Grand Island. The propagation, drafting of a Constitution, at least one preliminary meeting, and a meeting at which a Constitution was adopted, and officers were elected, have all been accomplished by K. L. Bonebright of Lincoln, since his attendance at the Convention of National Sheet Metal, Roofing, Heating and Air Conditioning Contractors Association, held at Cleveland, Ohio, on January 25, (Mr. Bonebright, is a member of the Board of Directors of the new National Association). It is noteworthy that the name of this new State Association conforms to the name of the National Association. In fact, Mr. Bonebright set out to organize his State, not only for the purpose of forming a State Association, but to automatically create a group-membership for the National. Truly, "Where there is a will, there is a way."

The officers of the Nebraska organization are:
K. L. Bonebright, 1614 N. Street, Lincoln, President.
William E. Simon, North Platte, Vice President.
Everett W. Green, 2747 North 48th, Lincoln, Secretary.
J. J. Rutt, McCook, Treasurer.
The Directors are: John Crowley, Lincoln; George B.
Hinman, Lincoln; Oscar Hehnke, Grand Island; Gerald C.
Krause, Lincoln; William F. McCormick, York; Francis
McElroy, Grand Island.

A copy of propagation letters sent this office by Mr. Bonebright, reveal that the constitution adopted, conforms with the Code of Regulations of this Association. May I publicly commend Mr. Bonebright for his zeal, and express the hope that others may be inspired to do likewise.

Henry C. Bitter, Executive Secretary, National Sheet Metal, Roofing, Heating and Air Conditioning Contractors' Assn.

Ohio

The Jobbers' and Salesmen's Auxiliary to the Sheet Metal Contractors' Association of Ohio, of which Homer Cunningham of Cleveland is president, and Lee W. Gillespie of Cincinnati, secretary-treasurer, is offering a 1940-1941 wall card with a list of manufacturers and jobbers of sheet metals, roofing, formed products and supplies; furnaces, fittings, registers and supplies; and blowers, controls, paint, etc.

ODUCT

For your convenience a number has been assigned each item. Circle the items in which you are interested on the coupon on page 92 and mail to us.

■ Indicates product not listed in 1940 Directory.
△ Indicates manufacturer not listed in 1940 Directory.

▲131—Mayn Air Damper
Controlair, Inc., Elyria, Ohio, announces the Mayn Air Damper, to be installed in the register and grille stackheads, complete with the damper



blade, hinges, adjusting screw, nut, screw bracket and special adjusting tool.

The Mayn Air Damper has an automatic locking device, is accessible with the register or grille in place, controls air delivery, is tamper-proof and is rapidly installed. It is rigidly constructed.

132-Webster-Nesbitt Conditioners

John J. Nesbitt, Inc., Holmesburg, Philadelphia, offers Series R conditioners for year around air conditioning for large and small residences. The unit, coupled with a steam or hot-water boiler, may be employed to heat a home or to divide the heating load with supplementary radiation, forming what is commonly known as a split system. For heating control,



Series R units are adapted to methods that range from simple off-and-on operation suitable for small residences to the continuous graduated control best suited to houses with many rooms.

During the heating season a simple cascade humidifier adds moisture to the air. In summer the circulation of chilled or well water through an

amply sized cooling element brings relief from oppressive heat and humidity.

Air circulated by Series R units is cleaned by passage through a bank of air filters.

The Series R is in two sections-a fan section and a conditioning section. The conditioning section takes either of two forms, depending upon the requirements of the installation.

There are eight sizes-750 to 4,000

133-R183B Stokerelay

Minneapolis - Honeywell Regulator Company, 2950 Fourth Avenue South, Minneapolis, announces the new R183B Stokerelay, combining a relay and a simple synchronous timing mechanism in a single, compact unit, to maintain the fire in stoker-fired furnaces during mild weather when

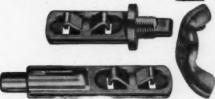


the thermostat does not call for heat often enough to keep the fire alive. Its timing is easily adjusted to operate the stoker for ½ to 7½ minutes once every half hour or hour.

The cover is finished in black Kristo Krak encloses the front and two sides, while the base which is plated is constructed to form the top and bottom of the control. The instrument is 6% high by 7% wide by 3½ inches deep.

134—Snap-Tite E-Z On

The M. A. Gerett Corp., 2745 N. 39th St., Milwaukee, offers a new, perfected snap-end bearing regulator—the Snap-Tite E-Z-On. A wedge lock

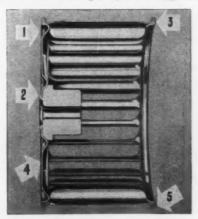


works automatically and once locked, allows no end play.

The new Snap-tite E-Z-On regula-tor is made of cadmium plated steel and is applicable with a hammer. A free sample set is offered.

135—Airotor Blower Wheel

Torrington Manufacturing Company, Torrington, Conn., announces a blower wheel - a simplified Airotor. Four parts, including the



hub are used in its construction. Neither welds nor rivets are used in

Neither welds nor rivets are used in its assembly.

The new Torrington Airotor wheel includes:

1. Concentric rib serving as backing for blade strip, formed at the same time as the hub socket.

2. Hub fitted and fastened securely to a cone-shaped socket to insure concentricity and rigidity.

3. Deep formed concentric rib. This rib bears against the end of blades to minimize cantilever blade deflection. flection.

nection.

Deep formed radial ribs blending into hub socket, thereby stiffening back of wheel and resisting deflection by thrust against hub. Three thicknesses of metal make for a maximum strength.

Construction is of steel and wheels are supplied in either cadmium or lacquer finish.

136—Adds Heating Division Utility Fan Corporation, Los An-

geles, manufacturer of blowers and air coolers, is now entering production of an extensive line of gas-fired heating equipment. In addition to the facilities in Utility's present plants, the company has added new equipment for the heating division.

The new Utility line will include five models of vented and unvented circulating heaters with or without forced draft feature; two sizes of floor furnaces, closet and basement type forced-air furnaces. The forced-air equipment includes the dynamically-balanced Utility blowers.

Distribution will be through established heating trade channels.

New Products

For your convenience in obtaining information regarding these items, use coupon on page 92.



137—Oil-Burner Motor

General Electric Company, 1 River Road, Schenectady, N. Y., announces a new oil burner motor designed to harmonize with the appearance of modern oil burners and built to match the requirements of this type service.

A manual reset overload protective device is optional.

•138-Heatmaker Bin Furnace

Iron Fireman Manufacturing Company, 3170 W. 106th St., Cleveland, and Portland, Oregon, announces a bin-fed winter air conditioner—self-contained warm air conditioner complete with furnace, stoker, humidifier, circulator and air filters. A screw conveyor fits into a nearby fuel bin.

The heater is made of heavy, die-formed, steel plates electrically welded to form a gas-tight, one-piece unit. The combustion chamber is sized and proportioned to the fuel burning rate. Heating surface and three flue-gas passes permit a maximum transfer of heat to the circulating air.

The stoker is an Iron Fireman automatic underfeed stoker, designed for this unit.

On bituminous models, the cinders and ashes are removed from the hearth and placed in a covered container located within the unit. Anthracite models are arranged so that the ash drops from the retort to a pit under the furnace.

The circulating air fan is driven by a separate motor. Controls are provided to operate the fan suspended on rubber mountings. Motor is of totally enclosed capacitor type, with built-in thermal overload protection, and resilient mounted for quiet operation.

Each unit is equipped with two 25 x 16 in. spun glass filters, impregnated with oil, located in the cold air return chamber.

Maximum output at bonnet is 100,-000 Btu per hour.

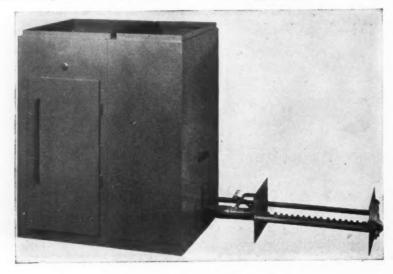
139-Water Level Control

McDonnell & Miller, Wrigley Building, Chicago, announces a new snapaction humidifier valve—a cam-androller action which causes it to snap from tight closure to wide open whenever the water level drops a quarter



of an inch. When the water level rises to the proper level, the valve snaps to the closed position, seating against water pressures up to 150 lbs.

The No. 17 control consists of the valve and float only, 10 9/16 in. in length. No. 117 includes the valve and float in a covered float chamber—size 11 in. long by 3 in. wide and 4% in. deep. No. 217 adds copper tubing and a means of tapping into city water supply line.





•140-Lochinvar 60 and 60G

Lochinvar Corporation, 14247 Tireman Ave., Dearborn, has added two new models recently to the Lochinvar line of oil burning furnaces—Models 60 and 60 G. These models were designed to fit the smaller home in size and price. The Model 60 is a complete oil burning winter air conditioning unit with 59,000 Btu. output at bonnet. Its dimensions are 24 wide x 26 deep x 67 in. high.

The Model 60 G is a completely automatic oil burning, warm air gravity furnace, with a 59,000 Btu. output at bonnet. Dimensions are 24 wide x 26 deep x 51 in. high.

Both models are attractively finished in a new green hammered metal finish that is easily cleaned.

Each model has been approved and is listed as standard by Underwriters' Laboratories. Specifications are available.

141-Midget Relay

Advance Electric Company, 1260 W. 2nd St., Los Angeles, announces a new Midget relay. Actual dimensions are 1½x¾ in. May be mounted on any type of panel due to ungrounded



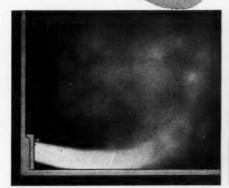
construction. A 6/32 stud accomplishes installation.

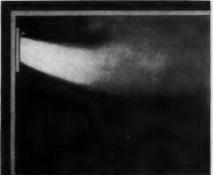
Coil and line connections are made to adequately long, tinned solder lugs, with ample spacing and insulation between all terminals and the relay frame. Complete technical data is available.

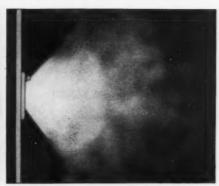
omplete Control

THAT'S WHAT CONTROL

IDITIONING INSTALLATION







ON BASEBOARD INSTALLATIONS

-horizontal louvers can be adjusted downward-covering the floor with a blanket of warm air-preventing cold, drafty floors. Hd.

I ON SIDEWALL INSTALLATIONS'

-a slight downward deflection prevents streaked ceilings and mixes the warm air with the room airpreventing stratification.

AIR CONTROL, the popular Air Conditioning Register, offers the perfect solution to the problem of securing even, draftless air distribution. For AIR CONTROL has these outstanding features-

- Fully adjustable for BOTH vertical and horizontal deflection.
- Adjustable after they are installed and decorated.
- Adjustable stop fixes up and down deflection, yet allows registers to be closed.
- Horizontal louvers located directly behind grille face—assuring use with any stackhead and even flow over entire grille face.

AIR CONTROL Registers are your insurance against drafty, unsatisfactory installations. Air distribution complaints can easily be corrected by simple adjustments from the face of the register.

Yet AIR CONTROL is low in price-Can you afford not to standardize on AIR CONTROL?

Have you tried AIR CONTROL'S sensational GRAVITY TYPE REGISTER?—adjustable for forced air—ideal for old house jobs.

ANY DESIRED DIRECTIONAL FLOW

-vertical fins may be adjusted to distribute the air to any part of the room -assuring even temperature, regardless of register location. An important factor on both Sidewall and Baseboard

WRITE TODAY FOR **NEW CATALOG 41**

(showing the complete AIR CONTROL line) and the name of the jobber in your territory who is handling AIR CON-TROL Products.



NTROL PRODUCTS,

New Products

For your convenience in obtaining information regarding these items, use coupon on page 92.

142—Steel Coal Furnace
L. J. Mueller Furnace Co., 2005 W.
Oklahoma Avenue, Milwaukee, Wisconsin, is introducing a new steel coal furnace, the Series 400, available in 20, 22, 24 and 27 in. sizes, in either a round galvanized gravity casing or in a modern styled all-in-one green, texture-lacquered fan-filter-furnace as-

All seams are hot riveted and welded; the radiator has a diffuser directly opposite the drum connection, which diffuses the heat and protects the radiator from direct contact with the hot products of combustion.

143—Gas Heat Rudico Steel Gas Rudico

The Rudy Furnace Company, Dowagiac, Michigan, offers a new line of steel gas-heat air conditioning fur-naces, carrying A. G. A. approved output ratings from 52,000 to 160,000

Btu per hour.

A Utility room type, 52,000 and 80,000 Btu outputs, and four basement units—52,000, 80,000, 104,000



and 160,000 Btu outputs-make up the line. Each of the four basement sizes has a choice of two blower sizes.

Utility room units are shipped completely assembled, wired and with controls in place. The 52,000 and 100,000 Btu output basement units are shipped with blower compartment and heating compartment assembled in individual crates.

All units have electrically welded, copper bearing steel heat exchangers with entirely rounded surfaces.

Special Vaporator humidifiers coated with flake aluminum to prevent corrosion and rust are standard on all units-two being furnished on large sized basement units. Standard Rudy blowers are used on all units.

144-Belt Driven Fan

The Emerson Electric Mfg. Company, 1843 Washington Ave., St. Louis, announces a new 42-inch, twospeed belt-driven cooling fan, suitable for attic ventilation.

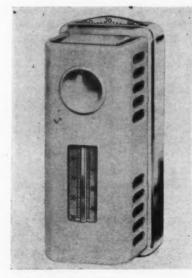
Blades are specially balanced, and mounting is resilient rubber. Shaft



on grease-packed, thrusttype, ball-bearings and entire assembly is resilient (rubber) hub-mounted. Capacitor motor, with inbuilt, automatic motor protector is located and mounted to simplify servicing. housing has mounting holes drilled in the face to facilitate mounting on wall.

-Thermostat

White-Rodgers Electric Company, 1207 Cass Avenue, St. Louis, an-nounces a new thermostat—No. 176 line voltage—with an adjustable stop to limit the maximum temperature at



which the control may be set, in a locked case.

The scale may be set up to "Sum-er" without disturbing the winter temperature stop.

146—Oil Burning Furnace
The Quincy Stove Manufacturing
Company, Quincy, Illinois, announces
the new Oilfire Monogram automatic
furnace, featuring Monogram patented gravity vaporizing oil burner.
Medal 100 is vated at 20 000 Rtu

Model 100 is rated at 90,000 Btu, Model 200 at 125,000 Btu, Model 150 at 120,000 Btu, Model 250 at 150,000 Btu and Model 101 at 70,000 Btu at the bonnet.

The outer casing is 22-gauge steel finished in pastel green ripple, insu-



lated full height with one-inch Rock-

Propeller fan is encased in cold air return. It provides mechanical draft to burner on high fire and circulates heated air throughout the home. Low fire operates on natural draft and heat from the low fire circulates by gravity. When the thermostat calls for heat, the automatic burner control starts to function—admits more oil to burner and starts the fan, creating sufficient draft to burn the oil properly and circulate the heat throughout

147—Automatic Feed Stoker

Round Oak Company, Dowagiac, Michigan, offers a new Automatic Feed coal stoker. A rugged crusher block breaks all large lumps of coal and an emergency clean-out permits easy removal of any obstruction.



Features include automatic air pressure damper control (tamperproof), cast iron vertical Tuyere retort, cast iron hopper base and precision direct drive feed.

The Round Oak stoker is available in six standard sizes—hopper capacities from 325 lbs. to 1,000 lbs. Hopper is furnished in wood grain finish or Hammerloid Blue.

New Literature

For your convenience in obtaining copies of new Literature use the coupon on page 92

191—Vitalaire Room Coolers

Ice Cooling Appliance Company, Morrison, Illinois, is distributing a folder covering their Vitalaire portable unit room coolers for the hotel, office, sick room and in the

192-Arc Welding Electrode Chart

The Lincoln Electric Company, 12818 Coit Road, Cleveland, is offering shop superintendents using welding a chart which gives uses, physical characteristics, etc., as well as currents and procedures for some thirty-six different electrodes.

193—Summer Cooling in the Research Residence
The University of Illinois recently distributed to the
membership of the National Warm Air Heating and Air Conditioning Association Bulletin No. 321 entitled "Summer Cooling in the Research Residence with a Condensing Unit Operated at Two Capacities."

-Independent Baseboard Registers

The Independent Register Co., 3747 East 93rd St., Cleveland, Ohio, is distributing a leaflet illustrating and describing their baseboard registers-700 Series-one-piece style, grille not removable, single valve, wrought steel. Sizes and list prices are included.

195—Excelsior Heating Specialties

The Excelsior Steel Furnace Co., 114 S. Clinton St., Chicago, is distributing Catalog No. 7 T, covering Excelsior heating specialties. The 48-page book is indexed and covers single and double tin pipe and fittings; round

pipe, elbows and fittings; return air; forced-air ducts and fittings; registers, and furnace bonnets.

-Home Cooler Fan

Wagner Electric Corporation, 6371 Plymouth Avenue, St. Louis, is distributing a supplement to Bulletin FU-22 Section B, covering the Wagner home cooler fan—highcapacity, belted type in three sizes: 10,500 to 20,500 cfmfor home cooling (attic installation) and for industrial and commercial use.

197—Stakool Ventilating Equipment

Manker Products Company, Inc., Memphis, Tennessee, is distributing a 1940 dealer's manual covering Stakool attic, window and floor fans, and including making the survey for installation of attic fans, commercial fans and openings necessary when using fan for exhaust purposes. Installation instructions, with diagrams are also included.

198—Metal Letters

Newman Bros., Inc., 660 W. Fourth St., Cincinnati, Ohio, is distributing a folder covering their metal letters—cast or constructed bronze, aluminum or stainless steel. Standard styles are architectural, block, broadway, ribbon and modern. Prices are given for both cast and constructed sheet metal letters. All cast as well as constructed letters are furnished with anchors on the back for invisibly attaching to any type of wall.

79—Air Conditioning—Home and Commercial Fairbanks-Morse & Co., 600 S. Michigan Avenue, Chi-

cago, is distributing a 20-page catalog covering Fair-banks-Morse air conditioners. The various types of conditioners are described, Fairbanks-Morse equipment is pictured with brief description, testimonials are given, and installations in theaters, hotels, restaurants, cocktail lounges, office buildings, industrial plants, churches, funeral homes, department stores, homes and stores are illustrated and described.

Investigate this Jropic Breeze HI-BOY. WINTER AIR CONDITIONER



Tropic Breeze burner assemblies are interchangeable for gas or oil firing. You or your builders may tell customers that they can, at any time, change over from one fuel to the other (either way—gas to oil or oil to gas) at small cost. This unit takes little more than 4 sq. ft. of floor space, is not too high for cellar installation, yet perfect for utility room and will pass through 28" door. Tropic Breeze oil-fired models are offered in two burner types, gas-fired model includes Dalzen Multi-Tip Gas Burner. A packaged unit, designed for economical heating, beautifully finished for eye appeal, fully automatic. Priced right—profitable to handle!



Write for information regarding attractive terms and territories now available to dealers.

Multi-Tip Conversion Gas Burner for every type of heating plant!



Quickly and easily installed in any type of heating plant, steam, hot water, hot air or vapor. Produces more heat from a given amount of gas. Offers trouble-free operation, tested by thou-sands of installations. In-cludes latest type thermo-static and safety controls. Priced to make you money! You'll be surprised!

511 LEIB STREET

DETROIT, MICHIGAN

SAL-MO



Y OUR jobber knows the quality of all SAL-MO Asbestos Products and can quickly furnish you with the proper materials for insulation of all types of Warm Air Heating and Air Conditioning Equipment. Other well known SAL-MO products are, Furnace Cements, Flexible Asbestos Jackets for hot water tanks and Coverings for all kinds of Steam and Hot Water Pipes.

SEE YOUR NEAREST JOBBER FOR SAL-MO WARM AIR HEATING INSULATION

SALL MOUNTAIN CO.

176 W. Adams St.

Chicago, III.



New Literature

For your convenience in obtaining copies of new literature, use the coupon on this page.

200—Self-Starting Synchronous Inductor Motors

General Electric Co., 1 River Road, Schenectady, N. Y., is distributing publication GEA-3307, entitled "Self-Starting Synchronous Inductor Motors" for electric instruments, indicating instruments, recording instruments, small regulating or controlling devices, remote control devices, and other applications where a long-lived source of low-speed torque or power at constant speed is needed.

201—Bending Press Catalog No. 2002-3

The Steelweld Machinery Division, The Cleveland Crane & Engineering Co., Wickliffe, Ohio, is distributing Steelweld Bending Press Catalog No. 2002-3. The book carries through with reasons why the all-welded steel construction is used, to details of frame fabrication, machinery design, data on dies, typical bends possible, multiple-punching and other operations, plus engineering information.

Suggestions are included to cut costs and perform operations.

202-Tin and Its Uses-No. 5

The International Tin Research and Development Council, Battelle Memorial Institute, 505 King Avenue, Columbus, Ohio, is offering the fifth issue of "Tin and Its Uses, containing:

Adhesion of Bearing Metals; Protective Films on Tinplate; The Corrosion Resistance of Bronze Condenser Tubes; Industrial Use of Sulphite Cleaners; Collapsible Tubes; Market Brands of Tin; Speculum of White Bronze Plating; and the B.M.A. Civilian Tinned Ration; plus a report of the Council for 1939 and their Technical Service.

Inquiries are welcomed and no charge is made for information or assistance.

203—Premier Furnace Cleaner Specifications

The Electric Vacuum Cleaner Company, Inc., 1734 Ivanhoe Road, Cleveland, has prepared new specification sheets describing and pricing the company's complete line of equipment. In addition to the latest models of furnace and boiler cleaners, the new sheets illustrate a complete set of chimney cleaning attachments, including a chimney flue brush, a duct brush, a shield, a crank and eight fourfoot extensions for the flue brush.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave.,

Chicago, III.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Circle numbers in which you are interested):

131	132	133	134	135	136	137
138	139	140	141	142	143	144
145	146	147				
191	192	193	194	195	196	197
198	199	200	201	202	203	
Name .				Ti	tle	
Compan	у					
Address						

Are you Manufacturer—Jobber—Dealer—





It's a miracle to change a leaky, inefficient furnace with a burned-out firepot into a modern, gas-tight, refractory-lined burner in a few hours WITHOUT EVEN TAKING DOWN THE FURNACE. Still, it's being done every day with Fireline.

New Refractory Firepot Lining in Plastic Form

Fireline is fire brick material in plastic form. It is used to repair cracked and broken firepots and to protect and preserve castings. Installed one to 1½ in. thick entirely around the firepot (right over cracks and holes), it sets into a gas-tight, one-piece, fire brick lining.

In operation, the hot Fireline lining raises the temperature of combustion, burns fuel hotter and more completely, consumes furnace gas, smoke and soot, and reduces waste in ash . . . saves fuel and steps up furnace capacity.

The Answer to Many Furnace Problems

For the furnace man, Fireline is a "find." It provides an inexpensive means of repairing cracked and burned-out firepots. It answers the rush season service problem by giving heat the same day. Being plastic, it "fits" all firepots—meets the "orphan" furnace problem. It protects new firepots against burning-out.

Fireline gives you an extra profit on every job. It meets the competition of refractory-lined furnaces with the furnace you are now selling. It is ideal for replacing fire tile in steel furnaces, also for setting stokers and oil burners. Fireline will support a high labor and material profit and still save your customer money.

Fireline is stocked by leading jobbers in 50 and 100-lb. drums. Order from your jobber or write us for bulletin, prices and sales helps.

FIRELINE STOVE & FURNACE LINING CO. CHICAGO, ILLINOIS



The Greeks never had a name for this!

AQULUX

America's finest

OIL BURNING WATER HEATING UNITS

Modern, automatic, highly efficient, these powerful and compact vertical units are designed to supply hot water at minimum cost to homes, clubs, hotels, apartments, baths, etc. Easy to install... insulated against loss of heat on shut-down periods... burns diesel fuel oil or standard grade No. 3... B. T. U. output 85,000 (size 85) or 150,000 (size 150).

Powered by rapid heat-recovering Johnson "Bankheat" burner. Built by pioneer manufacturers of light & heavy duty oil burners, direct-fired air-conditioning furnaces, "Selectair" and split system conditioning units.



• Worthwhile territories and Johnson franchises available to aggressive dealers anxious to serve their communities with a complete line. Write today giving full details & qualifications.

S.T. JOHNSON CO. 940 ARLINGTON, OAKLAND, CALIFORNIA 401 N. BROAD ST., PHILADELPHIA, PA.

THERE'S A JOHNSON BURNER FOR EVERY PURPOSE

Association Activities

New York

The New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association, Inc., announces pledges for something over \$60,000 in premiums and has decided to go ahead with the group insurance fund.

A committee consisting of president George Ballard of Rochester, Secretary Clarence J. Meyer of Buffalo, and Theodore Steinhorst of Utica was appointed to contact group management organizations who wish to handle this group fund and find out just what they propose to do and what charges they will make for their services.

This committee is to report back to a meeting of the Board of Directors which will be called as soon as the committee is ready to recommend the group management which they deemed the best for our group. The committee expects to be able to report within two or three weeks and the committee will also recommend a definite date for the group fund to go into operation. This date will probably be August 1st or September 1st.

The members felt that it should be possible to increase the total of premiums pledged to \$80,000 or \$100,000 by the end of the year.

H. A. Daniel, Director.

Philadelphia

The Roofing, Metal and Heating Engineers, Inc., Philadelphia, will hold no meetings in June, July and August, according to the June issue of "The Trade Association News.

After two and a half years of study and practice, an association co-operative registered guarantee, backed by the best experienced mechanic tradesmen and cash, is in operation. Any home or building owner who possesses an Association Guarantee in addition to the Guarantee of

his roofer, may be sure that his roof is strictly first class in material and fabrication and will last the length of the guarantee, or longer. The Guarantee specifications have been made up from the experince of roofers who have had many years of experience and the advice and help of manufacturers who have made extensive research.

An engraved sample of the Association Guarantee and roof specifications, as well as directions as to how the Guarantee may be obtained by customers, and showing how to sell more quality roofs, is being sent to members. B. F. John, Secretary.

Florida

The Florida Roofer, No. 2, Vol. 1, dated June 15, contains five reasons for organization taken from the association By-Laws.

Quoted from an advertisement published by Tack and Warren, Clearwater, are a list of things "Money Can Not Buy"-real friendship, a clear conscience, the glow of health, true happiness, inward peace, character, a good roof (good roofing materials poorly applied will not keep out the elements), and a reputation for doing good work.

Listed are names of shops who have paid 1940 dues recently.

The death is reported of Joe Henderson of the Henderson Roofing Works on May 27, 1940.

L. A. Burgess, Secretary-Treasurer.

Milwaukee Picnic

The annual picnic of the Milwaukee Sheet Metal Contractors Association, Inc., will be held at Hilgen Spring Park at Cedarburg, Wisconsin, on Wednesday, July 24th, 1940.

A valuable souvenir is promised at the registration booth.

Local members invite State association members to attend the picnic.

Paul L. Biersach, Secretary. J. Goodwin, Chairman, Entertainment-Picnic Committee.

ON Re-Fil-Able AIR FII



Replace...Save Your Customers ONE-THIRD

Increase your sales by incorporating the Walton Re-Fil-Able Air Filter in your equipment. Cut filter replacement cost for user by about one-third. Easier to service. Dealers and distributors like it. It's extremely easy to use in any design.

You build into your design our permanent steel frame with a removable cover which contains the filter. To service it merely re-move old filter and insert new cartridge. This reduces filter cost

This Re-Fil-Able Walton Filter is the same high quality you have

always known . . . long life . . . high dirt removal efficiency and high dirt holding capacity . . . low air resistance . . . no adhesive in air stream . . . fire-proofed fibre material . . . odorless. The only difference is the manufacturing economy which you may pass on to the dealer and user. Investigate the possibilities for your line. It makes your equipment better and fully modern and stimulates your

Walton Air Filters are made in various styles and types. The Re-Fil-Able Model shown is Type

ISCONSIN

R-P ZEOLITE . FILTERAG

Never Before a Stoker Like This!

Successfully Burns Both

Coking and Non-Coking Coals!

Air-cooled, Oscillating Agitator! Air Volume Control!

If you are interested in an extremely low cost proven Bin-Fed Stoker that will successfully burn either high or low volatile coking coal and wish to avoid the long delay and high cost of producing one, here is your opportunity to complete your line. We offer our entire Bin-Fed Stoker that you can easily assemble and install with your own name plate on it and sell at a with your own name plate on it and sell at a profit



Write for Full Particulars

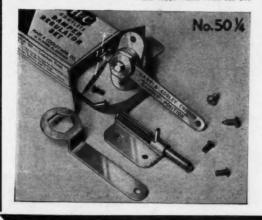
F. D. YARICK

18953 Roselawn DETROIT MICHIGAN





ECONOMY TYPE Quality at a Price!



HEC DAMPER REGULATOR SETS

Pick the Type that Suits you Best!

H&C offers four different sets, three of which, in the 1/4" size, are furnished with snap end bearing to permit the installation of even the smallest dampers without bending. All are quality sets in every detail with all parts rust-proofed; all are equally adaptable to splitter or regular dampers. See your Jobber or write for sample and descriptive literature.

HART & COOLEY MANUFACTURING CO. HOLLAND, MICHIGAN - - Chicago Office at 61 W. Kinzie Street

BRACKET TYPE (left)

With 1/4" Bearings-No. 501/4 -List Price 40c Set With %" Bearings-No. 50% -List Price 60e Set

DISK TYPE (right)

With ¼" Bearings-No. 80¼ -List Price 40s Set With %" Bearings—No. 80% —List Price 60s Set



Association Activities

Stoker Manufacturers 23rd Annual

A definite tone of optimism and enthuiasm prevailed at the 23rd annual meeting of the Stoker Manufacturers Association held the first week in June at The Homestead Hotel, Hot Springs, Virginia.

The two-day meeting devoted its attention largely to merchandising and sales programs and problems. However, the progress made within the past year in engineering and development work came in for particular study because of the increasing public interest in home building and construction.

The retiring president, E. C. Sammons of Portland, Oregon, who had served for two years, reported that the Association had completed its standardization work on minimum setting heights and stoker ratings and that the Engineering Committee is undertaking studies and other phases of standardization that would be reported on at

the winter meeting of the Association.

Officers elected for the ensuing year were:
President, Frank Hoke, Indianapolis, Indiana; Vice
President, B. O. Fink, Auburn, Indiana; and Treasurer,
John Munro, Harvey, Illinois. These three officers, together with E. C. Sammons, of Portland, Oregon, and
C. E. Lewis, of Rochester, New York, comprise the new
Executive Committee. Marc G. Bluth, Chicago, was reappointed Secretary.

Milwaukee

The Milwaukee Sheet Metal Contractors Association met on July 1 at the Club Room of the Medford Hotel, 607 Third Street, Milwaukee. Vice President Martin Schaar called the meeting to order in the presence of 19 members and 3 visitors.

John B. Pfiffner, general manager of the Milwaukee branch of the Hardware Mutual Casualty Company, addressed those present with introductory remarks on the main speakers' topics and was followed by K. E. McMillin and W. E. Kruenen of the same company. The former gave his version on compensation, liability-general and contractual from a legal point of view, while the latter talked from a business man's point of view.

The secretary reported the deaths of the following since the last meeting: Honorary member R. F. Jeske, Members Nathan Yampol of the Badger Sheet Metal Company, J. P. Schmidt of the J. P. Schmidt & Son (previously reported), and the wife of member E. S. Strobel.

Paul L. Biersach, Secy.

Blast Coil Manufacturers' Institute

The Blast Coil Manufacturers' Institute was formed by executives of manufacturers of blast surfaces for heating and cooling, at the Hotel Statler, Detroit, on April 11.

The officers of this new association are as follows: President—R. J. Resch, McQuay, Inc., Minneapolis Vice-Pres.—R. M. Stikeleather, B. F. Sturtevant Co., Boston

Secy.-Treas.-M. F. May, Young Radiator Co., Racine, Wis.

The primary purpose of this Institute is to develop and establish a standard method of testing and rating blast coils for heating and cooling.

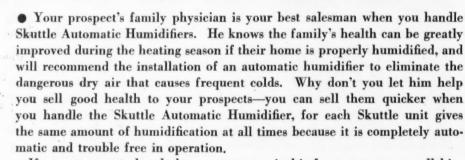
Fan Manufacturers Standardize

The National Association of Fan Manufacturers, 5-208 General Motors Building, Detroit, has approved a program of standardization to become effective the early part of 1941.

In the past each individual manufacturer has set up his own standards and as a result the industry has developed considerable confusion in the number of sizes.

The membership of the association includes American Blower Corporation, Autovent Fan and Blower Company, Bayley Blower Company, Buffalo Forge Company, Clarage Fan Company, Garden City Fan Company, The Green Fuel Economizer Co., Inc., Ilg Electric Ventilating Company, the New York Blower Company and B. F. Sturtevant Company.

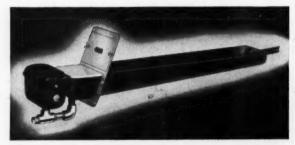




If your prospect already has a water pan in his furnace, you can sell him

the Skuttle SK Water Tender and convert it into an automatic humidifier by simply connecting the unit to the cold water pipe.

If you want to make additional profits with the Skuttle line, write us today for prices and literature.



NEW TYPE COLLAR SIMPLIFIES
CERAMIC INSTALLATION

Skuttle's new type collar is adjustable so that a ceramic unit can be installed by merely removing two thumb screws on the collar and taking off the cover plate to insert the unit. This is another Skuttle selling feature for ceramics get clogged in time and should be replaced as quickly and easily as filters.

WRITE TODAY FOR

J. L. SKUTTLE COMPANY

Skuttle AUTOMATICAL SHUMIDIFIERS

INFORMATION

999 FRANKLIN ST., DETROIT, MICH.

CAPTURE NEW SALES

with this new Molded Beauty . . . this Modern Styling



The

NEW

 $-\mathsf{G-A}-$

MIRROR-LITE

THERMOSTAT

... at the

• Get a bigger slice of the thermostat market with this new G-A MIRROR-LITE . . . smartly styled for greater eye-appeal . . . faster selling . . . greater profits!

Created by the well-known industrial designer Walter K. Long, it represents the first application of transparent plastic in the thermostat field—gives quicker, easier readability. Finished by a unique process, the G-A's soft tone blends well with any decorative scheme. Its smart, modern beauty...its sensationally low price... plus its proved sensitivity and dependability will make more of your customers want to buy it.

Check these fast selling features of the new MIR-ROR-LITE yourself—rush your trial order today—compare it with any other thermostat on the market . . . in beauty, features, price and PROFIT!

WRITE TODAY for FOLDER

Send us a postcard now for descriptive folder—detailed information about this new thermostat as well as the complete G-A line will be mailed immediately.



The New G-A "Magic Wheel"
Warm Air Circulator

Another new fast-selling G-A product that's already proved popular with dealers and customers everywhere. One fan takes care of every room in the house . . . new principle saves customers fuel—gives better heating at less cost. Rensonably priced . . . attractive profits. Write for descriptive folder.

DISTRICT REPRESENTATIVES

The H. M. Flemming Co., Inc. 30 Church Street New York City General-Associated Oil Burner Co. 1214 Springgarden Street Philadelphia, Pennsylvania Mr. Fred W. Forward 520 West Boulevard Elkhart, Indiana

Mr. Floyd T. Whitney 5736 12th Street Detroit, Michigan Smith & Dale 457 Stuart Street Boston, Massachusett Anderson & Pelleties 67 Carlton Street Toronto, Ontario

GLEASON-AVERY, Inc.

17 Clark Street

Auburn, N. Y.

THESE ARE THE FEATURES YOU WANT IN A FLOOR FURNACE



- ★ Full vitreous porcelain enamel inner heating unit, engineered to give the utmost in durability and efficiency.
- ★ Large heating surface and the long delayed flue travel for maximum heat from natural, artificial or mixed gas.
- ★ Unit crimped and sealed by a patented process providing best gas-tight and stay-tight construction.
- ★ Three walled casing of galvanized steel—inner double wall and main outside single wall. Full porcelain casing at small extra cost.
- ★ Combination safety pilot and automatic thermostatic control available at small extra cost for all Cole Gas Fired Floor Furnaces in the 20-30-40 series.

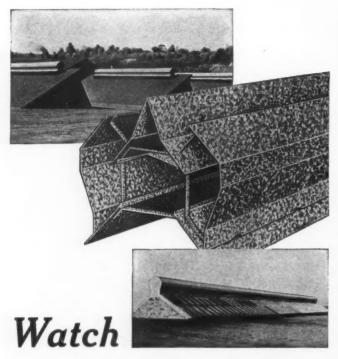


Cole Gas Fired Floor Furnaces are approved by the A. G. A. Installation is extremely sîmple. Furnaces are hung

from floor joists in buildings with or without basements. For full or auxiliary heating, Cole Gas
Fired Furnaces
give greatest
satisfaction at a
most reason
able first cost
and continuous

low operating cost. Write for full details today.

COLE HOT BLAST MANUFACTURING CO. 3100 WEST 51st STREET CHICAGO, ILLINOIS



your sales JUMP when you have the Swartwout-Dexter Heat Valve

in your kit bag

Here's a "winning number" for you in ventilators. The Swartwout-Dexter Heat Valve enables you to give customers more square feet of opening per dollar invested and a neat appearing job that they'll be proud of. You can sell miles of Heat Valve for all kinds of industrial and commercial buildings—flat, peak or sawtooth roofs.

The Heat Valve operates on the stack principle (natural draft) plus suction induced by air currents passing over the top. Designed for low air friction, assures high efficiency. Made in seven opening sizes, ten foot lengths—rigidly braced, constructed of high quality materials.

Add Swartwout-Dexter Heat Valve to your sales kit and reap profitable extra installations. We'll help you with engineering advice. And for all-around flexibility in meeting any situation, investigate Swartwout Rotary and Swartwout Airjector. Complete data, prices and discounts sent promptly on request. Write today.

The Swartwout Company
18615 Euclid Ave. Cleveland, Ohio

Swartwout VENTILATION SPECIALISTS

With the Manufacturers . .

Industrial Progress Award Program

The James F. Lincoln Arc Welding Foundation, Cleveland, is distributing a booklet entitled "We Who Work at Our Industrial Jobs," including a plan for participating in the \$200,000 Industrial Progress Award Program, covering advances and improvements made between now and June 1, 1942.

Meyer Operations in New Plant

F. Meyer & Bro. Co., Peoria, Illinois, has purchased a larger and better-located building at 308-318 Commercial Street, running through to 309-317 S. Water Street, Peoria, and new machinery is being installed as quickly as possible, supplementing a small amount of machinery and dies which were salvaged from the five-story plant which burned on May 27. General offices at 1311-13 S. Adams Street were not affected.

The company manufactures Handy pipe and duct work.

Anthracite Training Course

Anthracite Industries, Inc., New York City, recognizing the need for authoritative technical and practical information for the training of qualified personnel, offers dealers a comprehensive training course covering Anthracite stoker installation, operation and service. This course is being offered as a field school in key cities throughout the Anthracite-burning area.

The stoker schools provide one central industry-sponsored course of practical instruction on all phases of Anthracite stoker installation and service—including a study of fuels, draft and combustion, heating requirements, boilers, systems and controls for stoker firing.

YOU CAN ALWAYS DEPEND ON

THARCO

ASBESTOS FURNACE CEMENT

FOR YEARS, the leading furnace manufacturers and repair men have used and approved Tharco Asbestos Furnace Cement. This does not happen by chance. Men who realize that the success of any furnace installation

depends primarily on the furnace cement, have discovered that Tharco is far and away the leader in its field

THE PROPER
USE and CARE
FURNACE
CEMENT

Get this folder from

ASK YOUR JOBBER FOR THIS VALUABLE NEW FOLDER

Save money on those expensive call backs by knowing more about furnace cement. This new folder gives you the latest information. Quickly and easily read.

THE ARMSTRONG COMPANY

Bettilyon Entertains Williamson Dealers

Walter C. Bettilyon, heating supply jobber, 50 Spice St., Boston, was host to 138 Williamson furnace dealers celebrating the 50th birthday of the Williamson Heater Company at the Hotel Commander, Cambridge, on May 23rd. The program was jam-packed with helpful sales and merchandising ideas.

Joseph A. Stermer of Cincinnati, told how his company

sells a warm-air gravity furnace.

Frank E. Fehlman, newspaper advertising and research authority, explained how and why any furnace dealer can get the people interested in buying a furnace to come to the dealer.

Sheet Metal Supply Management

The Sheet Metal Supply Company, of Milwaukee, Wis., will extend its efforts in heating and air conditioning. E. M. Spence has been appointed to head the department. The company has represented the Moncrief line in Wisconsin for many years, although they do not handle Moncrief supplies exclusively. It is planned to increase its stock of Moncrief furnaces and winter air conditioners and to further improve its facilities to give Moncrief dealers service.

Howard Becomes General Sales Manager

The appointment of E. T. Howard as general sales manager has been announced by General Controls Co., manufacturers of pressure, temperature and flow controls.

Howard has been with the company for the last six years. He will make his headquarters at the company's general office and plant at Glendale, Calif.

Howard recently completed a three months' trip throughout the country on which he visited each General Controls branch office and distributor, and at that time opened a branch office for the company in Boston, Mass.

BENDING WHITNEY-JENSEN METAL

TOOLS YOU NEED TODAY!

NO. 58 FOOT PRESS

Capacity, 2" hole in 16 ga. iron.
Throat depth, 18". One of four sizes,
Can be operated at 100 holes per minute and better. Adaptable to a wide
variety of shop uses and production
operations. Special punches or forming
dies can be furnished, properly designed
by our experienced engineering staff.

OVER 80 USEFUL ITEMS
Write for your copy of Catalog No.
13, showing the full line of Whitney-Jensen metal-working tools and machines.





NO. 455 COMBINATION ANGLE IRON

SHEAR - NOTCHER - BENDER

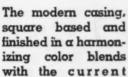
Fabricate angle iron completely on this one combination unit! Capacity, 2" x 2" x 14" angles. A strong, sturdy, accurate machine comprising Shear, Notcher, and Bender on a single welded steel stand. A firm foundation, but easily moved when necessary.

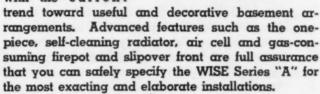
WHITNEY METAL TOOL CO. . 91 Forbes Street, Rockford, Illinois

Of it's a GRAVITY or AIR CONDITIONING PROBLEM

.. Here's the Solution!

You don't have to look any further than the WISE Series "A" for the answer to difficult gravity heating or air conditioning problems. Substantially built, economical and efficient in operation, and priced to enable you to meet your competition... these units will "fill the bill" every time.



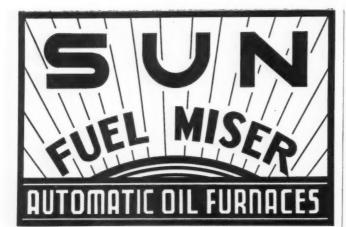


Drop us a line today for further details.

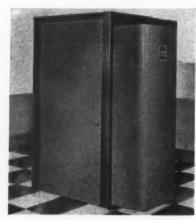


WISE FURNACE COMPANY

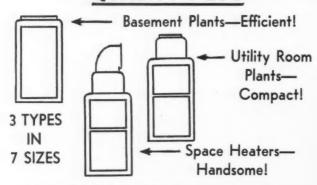
AKRON, OHIO



Make You Money and Friends



QUALITY PLUS



From 80,000 to 400,000 B.t.u. per hour

LOOK!—Bonnet Ratings vs. Floor Dimensions

	Floor	Dimensions
B.t.u. per hr.	Basement Units	Utility Room Type
at bonnet	inches	inches
90,000	35 x 36	21 x 36
125,000	24 x 48	32 x 40
165,000	32 x 62	40 x 56

They're PRICED RIGHT

LOW COST HOUSING MARKET WRITE TODAY!

J. V. PATTEN CO., Inc., SYCAMORE, ILL., U.S.A. Write for special data on wheels, housings and light duty assemblies.

News Items

Training Program for National Defense "Trade and engineering schools throughout the United States are ready to launch a training program designed to meet the additional labor needs as they are being outlined by the Advisory Commission to the Council on National Defense." This statement was made by Federal Security Administrator Paul V. McNutt as he announced a conference of national and State leaders in vocational education being held in the U.S. Office of Education to make plans for the program. This program supplements the existing vocational education program carried on under the Smith-Hughes and the George-Deen Acts.

Administrator McNutt reported that the program to be launched immediately has been authorized by Congress through an additional appropriation of \$15,000,000 to the U. S. Office of Education. These funds will be distributed upon recommendation of the Advisory Commission to the Council on National Defense to local schools and colleges of engineering through the State boards for vocational education.

The Commissioner of Education urged all schools and colleges desiring to cooperate in the training program to communicate at once with State boards for vocational education.

Trade schools under this summer-time program of national defense training will include instruction for aircraft mechanics, machinists, auto mechanics, sheet metal workers, welders, cabinet makers, pattern makers, electricians, blacksmiths, riveters, lathe operators, punch press operators, drill press operators, draftsmen, and for assembly line operatives.

Steam and Hot Water Research Program Problems of actual operation of steam and hot water

FOR SUMMER PROFITS

Sell Comfort Cooling



EVAPORATIVE COOLING, LOWEST IN ALL COSTS, IS SWEEPING THE COUNTRY

Cooler-aire PACKAGE UNITS COOL, CLEAN, WASH, FILTER AIR IN STORES, TAVERNS, SHOPS, BEAUTY PARLORS, OFFICES, HOMES

You can make money bringing Kooler-aire comfort cooling to the average business and home. Kooler-aire is low cost cooling. Easy to install, inexpensive to operate. Delivers big value. Write for complete details. USAIRCO shows you how to

sell and install comfort cooling. Complete merchandising helps.



STATES AIR CONDITIONING CORP.

heating systems in a small home, are to be carried on by the University of Illinois Engineering Experiment Station, Urbana, in co-operation with the Institute of Boiler and Radiator manufacturers. A typical modern six-room small house for this purpose is to be erected by the institute at the campus to be ready for research use during the coming winter heating season. In summer it may be used for home cooling studies, to complete the year-around comfort air conditioning cycle.

The new program provides for a long-time study of steam and hot water heating for small homes. Work in the new I-B-R Research Residence will be directly in

charge of Warren S. Harris.

Proper Credit for Illustrations

In the June issue, pages 37, 38 and 39, we published an article—"Attic Ventilation for Commercial Purposes Is Solicitated by Krauss Engineering." Air Controls, Inc., 1933 West 114th St., Cleveland, Ohio, writes us that the photographs and diagrams were taken from the company's published literature and submits leaflets and booklets in substantiation. We regret that proper credit was not published and are glad here to tell readers that these illustrations show Rex-Airate units and should be credited to Air Controls, Inc.

We are also advised by F. A. Litzebauer of Litzebauer Brothers, Inc., 809 Clinton Ave., Newark, N. J., that the installation in the bakery, page 38, was engineered, sold and installed by his firm. We apologize for this error.

Joseph L. Baker Dies

Joseph L. Baker, a founder of the Baker Ice Machine Company and the United States Gypsum Company, died early Thursday morning, June 27, at Omaha, Nebraska. Mr. Baker was 85. He had been inactive the last two years and had been in the hospital since June 22.

Surviving are two sons, Richard L., of Omaha, and Chester A., of New York; a daughter, Mrs. Harry G. Kelly, Omaha; and seven grandchildren.



HERE ARE 2 BETTER HUMIDIFIER VALVES!





No. 305—specifically designed for a pan mounted in the bonnet of conventional type warm air furnace.

No. 300—suitable for various types of Units.

...and here are 5 reasons WHY!

- 1. Both the No. 300 and No. 305 Units are so mounted that the valve mechanism is completely outside the furnace or air conditioning unit. This eliminates trouble from corrosion or foreign matter in the water.
- 2. Both Units have the important new, exclusive M-VB Pyrex glass float which is corrosion-proof and free from temperature-breakage. This float gives long, trouble-free service no matter where used or what the mineral content of the water may be.
- **3.** The valve in both No. 300 and No. 305 has large passageways holding water-rush and splashing in the opening and closing of the valve to a minimum even under relatively high water pressures.
- **4.** Typically topnotch M-VB with heavy <u>castings</u> and accurate machining throughout.
- **5.** All the advantages of a valve mounted in a separate outside reservoir—but at substantially lower cost, and without the corrosion problem.

These new M-VB humidifier valves with the new Pyrex float are important news to all who manufacture or sell and install warm air furnaces or air conditioning equipment. Get in touch with your manufacturer or M-VB today.



M-VB

MORENCY-VAN BUREN DIVISION SCOVILL MANUFACTURING CO.

Sturgis, Michigan

SCOVILL SAVES YOU TIME IN SELLING—TIME IN INSTALLING

Complete lines of humidifier valves maintained at Waterville, Connecticut—San Francisco and Los Angeles, California

Evaporating Capacity Required					ired
Fire Bonnet Pot Output Diam. BTU's		Gravity Forced Weathers	Air If	Forced Air If Not Weatherstripped	
20"	72000	400	8	800	16
22"	90000	500		1000	20
24"	108000	600	12	1200	24
26"	126000	700		1400	28
28''	144000 .	800	16	1600	32
29''	162000	900		1800	36
31"	180000	1000	20	2000	40
34"	216000	1200	24	2400	48
	252000	1400	28	2800	56
	288000	1600	32	3200	64
	324000	1800	36	3600	72
Coal Hand Fired	Oil, Gas, or Stoker Fired	Sq. Ins. Water Surface	Number of Plates	Sq. Ins. Water Surface	Number of Plates

MONMOUTH SPEEDY CAPACITY FINDER

ON HUMIDIFICATION

Conditioning furnaces you sell should have humidifiers capable of delivering adequate humidity under intermittent furnace operation and low bonnet temperatures of forced draft. The grossly inadequate humidifiers supplied with SOME conditioning furnaces will not do.

Customers are getting smart. They know that humidification is the most important health feature of conditioned air heating. They buy humidity indicators nowadays. And when they find that the humidifier of their new furnace is only a bluff, YOU are held responsible.

Buy only furnaces that include a humidifier of adequate capacity AS STANDARD EQUIPMENT or specify that furnaces you order shall have humidifiers of adequate capacity. The additional cost for Monmouth scientific humidification is slight and by featuring its many advantages, you can close a higher percent of orders you work on, at higher price and profit.

Write for our capacity chart which tells what size humidifier any furnace requires to give proper humidity and customer satisfaction.

MONMOUTH PRODUCTS CO. 1933 E. 61st St. Cleveland, Ohio

MONMOUTH
The Greatest Name in Humidification

Air Conditioning For Hayfever Relief

(Continued from page 48)

found on the screens and around lights. Insects of the beetle and cockroach group are apparently unimportant in the relationship to allergy.

Patients can become sensitive to certain specific types of dust accumulating in certain places, especially in the dark corners of certain rooms, in curtains, upholstery, under the beds, and in carpets. This fact has proved most useful in the diagnosis and treatment of asthma, especially of the type called house asthma. The element in dust which is primarily responsible for this sort of illness probably varies. In one case it was proved definitely to be fungus. One patient who suffered from asthma constantly for eight years was proved sensitive to something which could be extracted from one rug. Her illness dated from the purchase of the rug, and she was cured completely by removal of the rug from the house.

Certain people become sensitive to certain varieties of smoke; wood smoke, coal smoke, to-bacco smoke, cigarette smoke, or the smoke from burning leaves. This type of sensitiveness can be so specific that a person sensitive to cigarette smoke may tolerate cigar smoke. One patient

For FORCED-AIR COMFORT in the LOW COST HOME use REX AIR-PAK Junior



It can be installed with any 18" to 22" gravity furnace at a total cost well within the 5 or 6% F.H.A. limits. Two sizes: Model JR 100-4 delivers 8 0 0 to 1 2 0 0 C.F.M., Model JR 120-4—from 1220 to 1850. Well-built, sturdy, compact, these units will pass through any door of average size.

Write today for specifications and prices to:

AIR CONTROLS, INC.

Div. of

The Cleveland Heater Co. 1937 W. 114th St., Cleveland, Ohio. was so sensitive to cigar smoke that the quantity carried home on the clothes of her husband at odd times would cause her to have asthma. Another patient highly sensitive to wood smoke could not live in houses with open fireplaces even though the fire was not burning. Apparently, enough of the fumes of wood smoke could be retained in the carpets and curtains and upholstery to cause her to have asthma.

Bacteria

Apparently people can become sensitive to bacterial products and can have allergic symptoms due to absorption of bacterial products. Author's note: Other agents causing hayfever such as drugs, foods, plant oils, scratches, and serums can not be eliminated by the use of air conditioning, therefore they are not included in this discussion.

Symptoms

General symptoms of allergy occur whenever a sensitive patient encounters and absorbs an amount of some substance to which he is sensitive in quantity which is in excess of his tolerance. With the onset of a reaction of this type, a person usually feels a sense of itching followed frequently by redness of the skin or hives, and frequently sneezing, coughing, or asthma; also frequently nausea, vomiting, diarrhea, and pros-

THE AKRON AIR BLAST FURNACE

"More than 50 Years of Leadership"

LEADERSHIP is attained only through consistently good service to the customer. That's why the Akron Air Blast Furnace is the leader in the field. For over fifty years there has been the same uncompromising quality built into these

furnaces and the value of such a policy reflects in the success the AKRON has enjoyed for the past half century.

The strength, economy and efficiency of the AKRON are directly traceable to its superior construction. Circular roller superior construction. Circular roller bearing grates, two-section firepot, threeway Air Blast which exacts every last bit of energy from the fuel, heavy feed section, and a radiator with more prime heating surface combine to make the AKRON the quality furnace among the top notchers.

A postcard request will bring you fur-







THE MAY-FIEBEGER COMPANY NEWARK OHIO



Burring . . . Turning . . . Wiring . . . Single Beading . . . O. G. Beading . . . Crimping . . . Slitting . . . Circle Cutting . . . Flanging . . . Elbow Edging. Interchangeable Rolls, Fast Power Operation

Write for Bulletin NIAGARA MACHINE & TOOL WORKS

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Buffalo, N. Y.

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KNOW AIR CONDITIONING



Send Today for

Samuel R. Lewis'

"AIR CONDITIONING FOR COMFORT"

Third Edition
288 Pages—Illustrated
\$2.50

Here is a book that presents—in simple, readily understandable form—every kind of information necessary for an accurate and thorough knowledge of air conditioning principles, equipment, and practices. Written by S. R. Lewis, a widely-known consulting engineer who has been active in air conditioning work for more than thirty years, it deals with all angles of the air conditioning subject from the practicing engineer's viewpoint. The designing procedures explained in the book are, for example, in every detail the same procedures employed today by the author's own organization.

Featuring this third edition are several entirely new chapters on phases of the subject not previously treated, including noise control, air conditioning measurements, air conditioning standards, fire protection codes and operating suggestions. Brand new designing examples are also used, together with new forms for recording the design data, the proper filling-in of which is explained step-by-step.

OF VALUE BOTH AS A REFERENCE AND TEXT

Engineers in air conditioning will find the new "Air Conditioning for Comfort" invaluable as a reference book, while salesmen, students, and others may rely on it to give them a clear knowledge of fundamentals, and of the latest air conditioning methods and equipment.

Send for a copy today. We know you will consider this volume the most readable and complete book on the air conditioning science you have yet seen. You will risk nothing in ordering a copy, for you will be privileged to return it for a refund if for any reason it should prove unsatisfactory. Order your copy now.

KEENEY PUBLISHING COMPANY

6 N. Michigan Ave.

Chicago, III.

tration. The blood pressure usually falls, and the patient's pulse gets rapid or weak. The patient may lose consciousness, get blue and have convulsions.

Puffiness and itching of the eyelids, slight redness of the lid margins, a tendency to tears and discomfort on exposure of eyes to light are frequent symptoms. Hayfever, sneezing, swelling of the membranes of the nose, nasal voice tones, excessive watery or clear secretion, and, in chronic cases, polyps affect the nose. Swelling of the lips and tongue, itching of the roof of the mouth, swelling of the soft palate, hoarseness, and a tendency to choke, are manifestations in the mouth and throat. Asthma, chronic cough, spasmodic cough, shortness of breath on exertion, a tendency to wheeze on breathing, and expectoration of clear mucous sputum, are signs of difficulty in the lungs. The difficulty in breathing may reach extreme grades and make it impossible for the patient to get enough air to sustain life.

Hives, swelling either general or local, itching of the skin, redness, ezcema, increased secretion of moisture and grease, or dryness and scaling are reactions of the skin according to its sensitivity. Headache is a common symptom of allergy. It may be extreme, in fact, may torture a person almost into a state of unconsciousness. Allergic migraine is relatively common. Vaughan

NO FAILURES HERE!



*

Simplicity and ruggedness characterize the construction of the Master Heat Regulator. Operates on temperature differential of only 1 degree. Almost unbelievable are performance records

reported by dealers everywhere. Unexcelled in its price class for dependability and accuracy. Manufactured by the WHITE MANUFACTURING CO., makers of scientific temperature controls for over 20 years. 2362 University Avenue, St. Paul, Minnesota

MASTER HEAT REGULATOR and Rowe believe food allergy is a common cause of migraine. Weakness, prostration, nervousness, trembling, convulsions, transitory paralysis, numbness of the hands or feet, or dizziness, are various grades of reactions of the nervous system.

Diagnosis

The discovery of the specific cause of allergy is often difficult. There is nothing in the practice of medicine which taxes the ingenuity, knowledge, and experience of a physician as much as studying out an obscure case of allergy. Certain tests of the skin, eye, nose, and diet are useful in unraveling the allergy problem. Skin tests are truly valuable in the diagnosis of reactions caused by pollen, dander, flies, feathers, and molds, but are often hopelessly inadequate and misleading in the working out of food cases. Specific tests with cold, light, and scratches are likely to give accurate information if carried out according to indications given by the history of a case.

Seasonal cases of hayfever, asthma, or eczema of the exposed parts are usually caused by pollen, fungi, or flies, occasionally by animals or plants, and rather frequently by heat, effort, cold, or light, and sometimes by a combination of two or more of these factors. When symptoms occur throughout the year, dust, foods, heat, effort, or

"Surest Money Maker For Jobber And Dealer"

"The Williamson Heater Company:

We are frank to acknowledge that before we embarked on this branch of our business we had determined to leave no stone unturned to associate ourselves with the best company, and consider ourselves fortunate in making the connection with you, which has resulted in years of pleasant and profitable furnace business.

Your Tripl-ife Furnace, with its 20-year-guaranty, appealed to us as the type of equipment the thinking home-owner would want. This has been amply proven by the demand we have had for this particular product, and I believe that today it is the surest money-maker for both the jobber and the dealer."

Signed- X Y Z, . . . Pennsylvania.

Complete information; name, address of writer of above letter furnished on request. Phone, wire or write The Williamson Heater Company.

FREE: Complete, easily understood short method for figuring air conditioning job. You can complete your figures, price job in one hour flat. Write Dept. No. 2. The Williamson Heater Company, Cincinnati, Ohio.

Complete Line . . . Quick Service

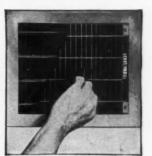
WILLIAMSON WARM AIR FURNACES

1890 — Golden Anniversary — 1940

REGISTERS · GRILLES and INDUSTRIAL SCREENS

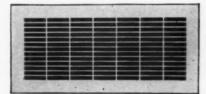
TOP-NOTCH BEAUTY AND PERFORMANCE

When installations must have beauty as well as high performance you can't go wrong by specifying and installing STANDARD registers, grilles or industrial screens. The choice of architects, contractors and engineers whenever an up-to-the-minute job is demanded.



Air-Con Fingertip Air Control

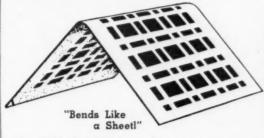
Illustration shows the Air-Con finger-tip air control register. Use of this face allows a directional air flow of 135 either right or left, up or down. This type of register is perfect for air conditioning installations, since changing or reversing the air flow direction from cooling to heating can be done merely by the degree of opening the SAME register.



Style No. 20 SIDEWALL GRILLE

The new low cost register and grilles are of modern stamped design and perform ideally on warm air heating and air conditioning installations. They are made in all standard sizes with large open area and with a sponge rubber attachment to prevent dust streaks.

PERFORATED METAL





The STANDARD line of industrial screens and fancy panels is unusually varied and the fine assortment of faces and perforations affords a screen or panel for every application.

WRITE TODAY FOR CATALOG

STANDARD STAMPING & PERFORATING CO. 3137 W. 49th PI. Chicago, III.

INCREASE YOUR PROFITS with



Complete line of Warm Air Heating Units

Dealers say FRONT RANK and MELLOW Heating Equipment is easy to sell. Their economical dependable performance has been tested and proven over a period of 52 years. All units have a certified rating by the National Warm Air Heating and Air Conditioning Association. The line is complete . . . Oil Burners, Registers, Forced Air Equipment, Hand Fired and Stoker Fired Furnaces. FRONT RANK'S efficient performance is proven by Illinois University rating of 15% higher heating capacity than we claimed.

"FRONT RANK" Winter Air Conditioning Furnace

Embodies the latest improvements that contribute to Health, Comfort, Convenience and Economy. Attractively finished in green morocco baked enamel. Priced to sell in competition.



"FRONT RANK" Steel Furnace

Has been tested and proven in actual service over a period of 52 years by more than 350,000 owners. Designed to last a life time. As a dealer you cash in on the reputation FRONT RANK has established.



"MELLOW" Cast Iron Furnace

Has been engineered to distribute maximum heat with minimum firing. Leak proof to prevent gas or smoke from escaping. Oversized automatic humidifier. EXTRA HEAVY. The favorite of thousands. Popular priced.



The volume of orders now being received indicates that FRONT RANK Dealers will make more money than ever before. ACT NOW . . . there's still time for you to join our rapidly growing Dealer organization and get your share of the 1940 profits. WRITE AT ONCE FOR COMPLETE INFORMATION.

Liberty Foundry Co.

cold, or some material encountered continually in homes or places of business, must be suspected. Careful diagnosis of the cause of allergy is essential to success in treatment. The patient, however, should not expect a complete diagnosis on his first or second visit to a physician. After one cause is found, others must be suspected.

Treatment

There seems to be at least nine different types of allergy each of which needs to be treated according to its special indications. Most important in the treatment of allergy is a physician who understands the illness and who understands the patient.

Hayfever, asthma, eczema, headache, or stomach trouble due to sensitivity can be treated along five lines, depending on the causes of the illness:

1. Avoidance or removal of specific cause of illness.

2. Avoidance or removal of contributory causes of illness.

3. Specific treatment with the agents responsible for the illness.

4. So-called nonspecific protein treatment.

5. Symptomatic treatment. Success in treatment depends primarily on a correct and complete diagnosis. Failure to obtain relief is almost always due to a wrong or incomplete diagnosis.

It is to be noted that of the five methods offered above for treatment of hayfever the first and second can be accomplished wholly by air conditioning and that air conditioning is an aid to the other three methods. The theories as to why the pollens and dusts, etc., cause hayfever will be discussed later.

[To be continued]

Evaporative Cooling At K.Y.U.M.

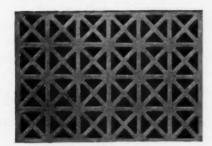
(Continued from page 43)

2 inches of rock wool, wired on, and were anchored with screws. Ducts, as well as all other metal work in the building, were grounded by attaching 2-inch strips of sheet copper, placed in ceiling, walls, and floors. Returns are of 6, 8, and 10-inch concrete tile, installed under the floor by the general contractor. The return air enters through registers about 10 inches above the floors and is dumped into a 2-foot 6-inch by 6-foot 6-inch plenum chamber in the cooler room.

(Continued on page 108)

ERFORATED METALS

ORNAMENTAL DESIGNS



Light steel sheets for radiator enclosures, metal furniture cabinets, radio speakers, etc. We stock sheets of various thicknesses and dimensions in a variety of designs.

INDUSTRIAL PERFORATIONS

All sizes and shapes of holes in any metal. Your inquiries will receive prompt attention.



WHITNEY LEVER PUNCHES



NUMBER FOUR "B" PUNCH

This punch for sheet metal work has a capacity of $\frac{9}{4}$ " through 16 gauge. Weight 3 lb. Length $\frac{81}{2}$ ". Depth of throat 2". Complete tool includes three punches and three dies of specified sizes with die adjusting key. A time-saver for your up-to-date shop.

And here's another handy tool for the modern shop—the No. 2 Punch. Length 23". Capacity 5/18" through 1/4" iron, weight 12 libs., depth of throat 1 11/18". Punches and dies 3/32" to 1/2" by 1/64".



NUMBER TWO PUNCH



Become the LEADING MERCHANT IN YOUR TERRITORY WITH Cor Clood Home comfort-providing coulpment

SUSTAINED

Gar Wood automatic home heating and air conditioning furnace-burner units led the nation in percentage of total sales in 42 key markets for the last four consecutive years—according to statistics published by a national trade authority. Cash in on Gar Wood's sales popularity. Become a prosperous leader in your community. Write or wire for the Gar Wood franchise facts.



PRODUCTS

Oil- or gas-fired automatic Tempered-Aire Winter Air Conditioning and Heating Units —Split Systems—Boller-Burner Units —Conversion Oil Burners for existing Bollers or Furnaces —Domestic and Cammercial Water Heaters—Ventilators—Airdux System for air distribution and control. Ask or write for descriptive literature.

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Jhe new BADGER HUMIDIFIER



"better than ever!"

The Badger Humidifier is "all new." Completely re-designed and still attractively priced, it will bring you many extra dollars of profit on new or old installations. Check the following features and see for yourself why the Badger is the humidifier "buy" of the year!

Evaporating pan of Stainless steel for quick evaporation and rust and scale-free operation.

Adjustable float and automatic valve located outside of plenum chamber. Valve is self-cleaning and positive in operation.

Entire unit substantially constructed for dependable service season after season.

Literature and further information available. Drop us a postcard today!

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743 N. 4th St., Milwaukee, Wis.

EASIER AND MORE PROFITABLE TO SELL BECAUSE IT GIVES USERS



Measured Moisture! Here's a talking point that gives you a big advantage over the dealer who offers furnace users just a mechanical pan filler. It's a plus feature of the THERMO-DRIP Humidifier... the direct effect of regulating the water feed by temperature. No more nor less evaporation occurs than the amount of water fed to the pan at any specific temperature. Investigate. Write for complete details or ask your wholesaler.

AUTOMATIC HUMIDIFIER CO.

18th and Main Streets CEDAR FALLS, IOWA

THERMO-DRIP Automatic HUMIDIFIER



Literally thousands of "The Joneses" in homes from coast to coast have "pre-purchased" a Conco Oil-Fired Airconditioner for 1940 installation. They've heard of Conco's purified "Packaged Sunshine," of its economical, completely automatic operation from friends who said, "Get a Conco — ours is wonderful." Will you take "Get a Conco — ours is wonderful." Will you take their orders? With Conco heating and conditioning equipment sales up 80% in 1939, dealers are looking toward even greater sales — greater profits in 1940. The Conco line is complete. Write or wire today for the force on Conco.



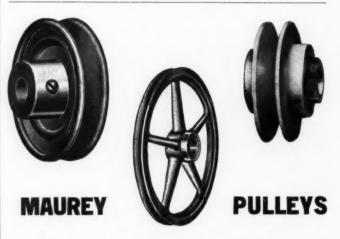
CONCO CORPORATION

Automatic Packaged Heat
Division of H.D.Conkey & Company

FOR FREE BOOKLET . 22 AUTO AVENUE, MENDOTA, ILL.

The general construction of K.Y.U.M. is considered ideal for comfort in desert heat. Outer walls are of standard 8-inch hollow concrete blocks, plastered. Window openings in outer walls of the studio, lobby, toilet, heater room and garage front have glass blocks, set in cement. Inside, the studio and control room air space and the finish of Acousti Celotex brings the wall thickness to 12 inches. Partition walls of these rooms have double rows of studs, with the air space divided by a layer of Celotex. Rocklath over the studs is plastered, then 1½-inch furring strips are used to attach the Acousti Celotex finish, leaving an additional air space between it and the plaster. Four inches of rock wool was placed over all ceilings (except the garage) between the joists, with ample air space between that and the roof. Over the studio, where both ceiling and roof are raised, there is a space of 2 feet. The ceiling of control room and studio are finished in Acousti Celotex

These features not only sound proof the two rooms, but they tend to repel the intense heat of the sun, which is ordinarily absorbed by solid walls and often retained from day to day during the summer. Many people still think that the early Spanish settlers in the southwest built thick adobe walls because they were cooler. In reality



MAUREY Variable Pitch and Steel V-Pulleys have long been leaders in the field of Fractional Horsepower Transmission. They are installed in the products of the leading manufacturers of Stokers, Blowers, Fans, Air Conditioning and Refrigeration Units.

The latest MAUREY development is the New Cast Iron V-Pulley. It is made with oval instead of the usual flat spokes, providing better weight distribution, strength and balance, for smooth, quiet, vibrationless running at high speeds. Annealed to prevent internal stresses and strains. Grooves are machined with micrometer accuracy to insure longer belt wear.

If your jobber cannot supply you with MAUREY V-Pulleys, or if you have a problem in F. H. P. Transmission to solve . . . write us. Large stocks carried in a wide variety of sizes for both "A" and "B" belts.

WRITE FOR CIRCULARS AND PRICES

MAUREY MANUFACTURING CORP.

Wabash at 29th, Chicago, Illinois

it was because adobe was the easiest material to obtain, and they necessarily had to be thick. The present trend, in Yuma at least, is toward thin double walls, which soon cool off when the sun goes down. Outer walls are usually stucco, the inner wall is plaster on rocklath.

"The flair for air conditioning which swept the southwest following the advent of the desert type cooler has swelled the volume of our business about 500 per cent since 1936," said Mr. Black. Yet it was only in 1934 that he installed the first desert cooler in the city. Expert minds have been working on the idea ever since that time, and from it have blossomed numerous attractive makes and models of desert cooler, evolved in various shops throughout the regions in which such air conditioning systems are feasible.

Will Blevins became associated with Mr. Black and they, along with several men, are now kept busy: They make a cabinet type cooler of their own design, they also merchandise a factorymade model, also making and servicing the Blevins Dry Air system, for those who prefer it. Sheet metal letters, of boxed construction, placed on the roof of the shop carry their air conditioning message to the public passing within a block or so.

H. H. Green, of Phoenix, was architect and W. J. Anderson, of Yuma, general contractor on K. Y. U. M.



GRAVITY HEATING

will keep you busy!

Gravity heating is a highly lucrative field for dealers and contractors who go after the business with the right unit and the proper amount of push! This type of heating installation has always been a steady, dependable source of profit to warm air heating men who give their customers the three prime requisites of a top-notch installation

The VERNOIS Furnace has all three of these important sales points. It's a good, tough, dependable heating plant and one you can specify and install without fear of troublesome

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callbacks.

Get on the VERNOIS band wagon now! Write us today for literature and sales helps to assist you in building a handsome gravity business.



MT. VERNON FURNACE & MFG. CO.

Mount Vernon

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New Low Priced R-600 Series For Forced Air Systems

Just the thing for low cost homes.
 Attractively designed for smart appearance.
 Attractively priced for economy.

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No matter what type of cutting — either irregular shapes or straight splitting—from ANY size sheet, you'll quickly find that the Marshalltown Throatless Shear is the most profitable tool in the shop. hundreds of odd shearing jobs — faster and better — and it's an inexpensive hand operated tool. Quickly cuts ANY shape in 18 gauge or lighter material.

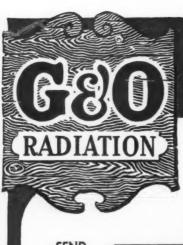
Send at once for Shear Bul-It gives all details of the Marshalltown line of sizes from 18 gauge to 1/2 inch capacity.



No. 18 Hand Power

MARSHALLTOWN MFG. COMPANY Marshalltown, Iowa 920 E. Nevada Street

AMERICAN ARTISAN, JULY, 1940



FINNED

HEATING COOLING

AVAILABLE IN A WIDE RANGE OF SIZES

SEND FOR CATALOG

WATER COOLING COILS



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Pioneer Manufacturers of Square Finned Tubing in the United States

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STANDARD E-Z-ON SNAP-TITE E-Z-ON



The addition of the Snap-Tite to the E-Z-ON family now gives to the contractor, damper regulators that will fill the requirements for ANY DAMPER ASSEMBLY JOB.

The new Snap-Tite E-Z-ON has all of the efficiency and economic features that have made the Standard E-Z-ON tops in damper regulators, plus . . . Snap-end bearing to eliminate damper bending. Automatic wedge I ock eliminating end play to insure a rattle proof job.



FREE to Air Conditioning Contractors... Sheet Metal Workers. With the single purchase of one gross of E-Z-ON damper regulators your jobber will give you one damper setting anvil. This anvil lists at \$2.50 and was perfected to further increase the application ease on E-Z-ON.

Get your anvil now! This offer is good for only 30 days. If your jobber does not have the anvil just send us your sales slip for one gross of regulators, and we will ship the anvil to you post paid.

M. A. GERETT CORP. 2945 N. 30th Street — Milwaukee, Wisconsin

Pennsylvania Convention

(Continued from page 83)

into the room in order to prevent any high velocity deliverance which might cause drafts and yet enable the use of high entering velocities in order to minimize duct sizes. Third: A slowing down of supply air streams when they enter a room is effected by the turbulent air layers set up between streams because of their angularity. Such turbulent layers offer great resistance to air flow and insure better mixing between supply and room air.

Fourth: By virtue of various air flow principles, air is drawn into the outlet from the room where it then mixes with the supply air, thus tempering the supply air. With anemostats, because of this mixing effect, a tempered mixture is always supplied to the occupied zone, preventing delivery of objectionable cold air and stratification of very hot air.

Galvanized Sheets

Nicholas Tiedeman, American Rolling Mill Co., speaking on galvanized sheets, explained the various processes and methods employed in galvanizing sheets; explained the purposes of the gal-



vanizing coat; and explained the grain structure of a sheet before galvanizing and the effect of galvanizing the surface.

Of practical value was the speaker's discussion of the present classification of coating weights and the methods now used to determine the weight of coating applied. Since so much of the long life properties of a galvanized sheet depends upon the base metal, the speaker explained present rolling methods, especially the continuous mill method. Mr. Tiedeman concluded by pointing out that care is necessary to preserve the coated sheet and how galvanized sheets should be stored, fabricated and finished to prevent breaking the coating.

A banquet brought the convention to a close.

Nassau Court House Copper Roof

(Continued from page 57)

building approached 55 tons.

Several flat areas also were covered with slag and composition roofing, while a large pitched area was roofed with gypsum slabbing edged with galvanized sheet steel. Prominent in supervision of the sheet metal work, along with Mr. Dibo, was S. Olshin, the other partner of the Webster company. The new civic building will house the major activities of Nassau County judiciary.

GENERAL CONTROLS



AUTOMATIC GAS SHUT-OFF CONTROL Thermocouple Type



THERMOPILOT A-100

proven thermocouple princi-of operation is employed on se automatic shut-off con-s. When pilot flame is applied thermocouple element, electri-contact is made, allowing the

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Ideal combination bench furnace for economical shop use. Designed for heating the largest soldering coppers, branding or stenciling irons; tempering, heat-treating, annealing, case-hardening or soft-metal melting. Firebox (\$\frac{6}{4}\times\times\frac{6}{5}\times\frac{6}{2}\ti

Use Low-Cost Johnson Soldering Fluids

This fluid can be used on all metals and their alloys except aluminum. Will not vaporize under high temperature, nor will it evaporate or deteriorate. Economical, because so little does so much.

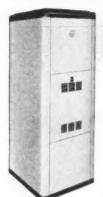
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Complete Line of OIL BURNING FURNACES

Viking is the "big hit" in the smaller capacity field. And no wonder! A complete line of Winter Air-Conditioning units designed from start to finish to meet heating needs of modern small-cost homes requiring furnaces rated at 55,000 to 100,000 B.T.U.'s. Amazingly efficient, low-cost operation.

Amazingiy cancellong Eight beautifully designed, compact units. Priced to sell in volume! Write for furnace catalog.

OIL BURNING WATER HEATERS

Low priced but quality built—and they always work! Famous for trouble-free operation. Completely automatic models as low as \$75.00 retail, installed. 20 to 45 gallons capacity. Breese burner equipped, door-mounted and shelf-mounted types. Modern styling, beautiful finishes. Write for catalog.

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YEAR AFTER YEAR OF TROUBLE-FREE PERFORMANCE

You can depend on your temperature controls for the full life of your heating or air conditioning installations—when Chace High Temperature Thermostatic Bimetals are used as the control element.

Neither time nor temperature impairs their action; for Chace extra-strength bimetals are engineered to stand up to the job, and to withstand heat far beyond that of ordinary operation. They will not weaken . . . They cannot leak. Year after year they continue to give exact, unvaried action; even under the most adverse conditions.

For long-lived, trouble-free performance, make sure that the heating controls you install are activated by Chace High Temperature Bimetal.

Specify Chace

Control manufacturers are invited to consult us for type of Chace Thermostatic Bimetal best suited to meet specific demands.



Expansion In Copper Roofs

(Continued from page 53)

Contrast this with the accompanying photograph which shows improper construction. Here the outside edge is directly nailed, instead of being anchored over an edge strip as it should have been. Moreover, the inner edge of the gutter is soldered instead of loose locked to the slope of the standing seam area of the roof (see later article on Intersections). Although some parts of the gutter construction illustrated in this photograph ran for distances of over 200 feet, there had been no pretense of an expansion joint installed. It is no wonder that this construction gave trouble.

In the upper illustration, detail "A" shows the method of finishing the cap at the roof end. Detail "B" is a water spreader, while the detail at "C" shows the loose lock of the cap at the outer edge.

Connecting Gutter Parts

In the bottom illustration is shown a longitudinal section of this same gutter. It should be noted particularly, that there is clearance provided at the two ends, "A" and "C," as well as at "B" where the expansion joint is located. It very often happens that the outlet from a gutter is at



The FREDERICK IRON & STEEL COMPANY

East Street

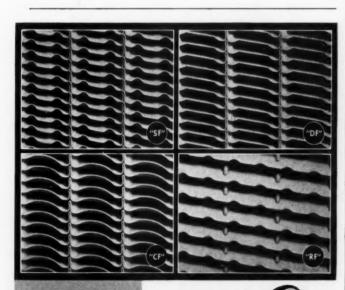
Frederick, Maryland
"Builders of Good Stokers for 20 Years"

one of the ends. This is usually a fixed point and the end next to it needs very little clearance as practically all the movement of the gutter lining is between this fixed point and the expansion joint.

Above this illustration is a dimensioned sketch showing the actual movement of the parts of an expansion joint which has been designed to provide for a total movement of $\frac{3}{4}$ -inch in expansion and $\frac{1}{2}$ -inch in contraction, the gutter being laid slightly below the midpoint of the temperature range for which provision had to be made. The height of the joint, of course, is the depth of the gutter.

Longitudinal Seams in Wide Gutters

When the gutter's width is increased, the construction is not always so simple. The lining sometimes requires a seam. This gives additional stiffness and permits the movement to and from the expansion joint to function properly. It is well to have this seam on one of the sloping surfaces, if possible, so that water will not stand against it. Another point in gutter construction is that cleats are omitted in cross seams. Further details about proper provision for expansion and contraction will be discussed in the next article of this series.



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ENGINEERED AIR DISTRIBUTION

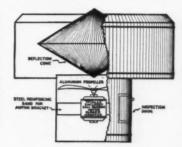
The unique UNI-FLO fin construction provides greatest diffusion, maximum flow capacity, minimum noise level, and positive air control. Shown are four types of directional diffusing finish by combination of which grilles or registers to suit any conditions can be accurately designed. Write for your copy of the UNI-FLO Catalog.

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ALLEN "STANDARD" FAN VENTILATOR

Allen Fan Ventilators give the dual service of the exhaust fan and roof ventilator, and are made in several types. The "Standard" illustrated here, is moderately priced equipment, well-proportioned, constructed of prime materials and in strict accord with Allen precise standards. Ventilator head of ample size is equipped with interior cone to reduce back pressure. Construction throughout is stout and efficient, motors are ball-bearing, totally enclosed, cradle mounted in rubber. Aluminum alloy propellers are dynamically balanced. Furnished in choice of metals.

Detailed specification sheets of this Standard Fan Ventilator, also Alco Fan Ventilators, Allen Turbine Fan Ventilators, Auxiliary Fan Sections, Isolated Motor-Fan Ventilators, and Allen Remote Drive Fan Sections, will be sent for your files with out obligation. Address:

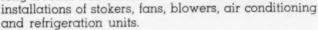


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CENTRAL pulleys have an enviable reputation for sturdy dependability under the severest tests. That is the reason CENTRAL white brass die cast pulleys give long trouble free service in installations of stokers fans





CENTRAL pulleys permit a freer flow of air through the spokes and are silent and true running. Make sure the

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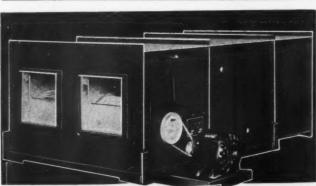
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Designed to control temperature and humidity within close limits. Can be made completely automatic in operation, regulated by room thermostat and humidistat.

Multitherm Units



Finest type of equipment available for small summer cooling, winter heating or complete year-round air-conditioning jobs. Widely used in factories, offices, stores, etc. Highly efficient; remarkably compact; easily installed in any idle space.

Write for Builetin 107 describing various arrangements and giving capacity ratings.

CLARAGE FAN COMPANY
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Sales Engineering Offices in all Principal Cities



Kruckman's Washington Letter

(Continued from page 34)

the technical officials of the FHA do not believe that price should be the controlling influence in determining the choice of equipment. They seem to feel that worth and performance are more important than cheapness. But first, last and all the time, they insist that it is the business of the individual to determine what he wishes to spend on his heating plant.

Preference for mechanical warm air equipment is implied by some officials rather than an explicit opinion. Mr. Vermilya is of the opinion that houses costing less than \$6,000 show a clearly increasing tendency to the installation of warm air mechanical equipment. It is believed that oil and gas have definite advantages.

It is characteristic that Mr. Thulman, as a personal opinion, records the conviction that warm air without forcing devices piped or ducted from the furnace, is the best installation for the \$3,000 to \$6,000 house. He holds it gives the most uniformly distributed heat.

In fairness to both Mr. Thulman and Mr. Vermilya it should again be emphasized that their opinions are not the formulated policy of the FHA and that the FHA officially apparently will not favor one type against another, nor will it recommend specialties or novelties, no matter how usefully attractive. At least there is no such policy at this time.

FHA Favors Warm Air

In essence, the FHA officials personally favor warm air, both mechanical and gravity installation; and the FHA officially has no opinion about types and kinds and fixes no proportional allocation of any part of the cost of a structure for heating equipment, but requires definite proof of the performance of the equipment it approves.

Building, they tell us here, is surging upwards. Over

QUALITY EQUIPMENT-- FROM HESS-- COSTS LESS



INCREASED SALES and PROFITS

Are assured if you sell Hess equipment. Why sell ordinary furnaces as sold by mail order concerns and other competitors when Hess offers superior value and performance at low prices.

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CHICAGO, ILLINOIS





Helpful Bulletins

Many useful engineering bulletins and catalogs are offered in the news and advertising pages of AMERICAN ARTISAN. For your convenience, we publish the following summary of such literature mentioned in this and recent issues. To obtain copies of these bulletins and catalogs described, simply indicate the paragraph numbers on the card below, detach and mail.

SUMMER AIR CON-DITIONING

Summer Cooling—A four-page folder covering the Premier Comfort Cooler is being distributed by Premier Furnace Company. Another folder covers cooling generally and mentions the Premier attic fan for night air cooling, a mechanical refrigeration type unit, and the Premier complete central system.

2 Air Conditioners—A 12-page book-let covers Philco-York air conditioners for home and office, made by Philco Radio & Television Corpora-

3 Cooling Surface — Condensing Units—Weather Control—36-page catalog "Long Life Direct Expansion Cooling Surface" with G-E electro thermal bond. 56-page catalog "Low-Cost, Dependable Condensing Units for air conditioning and refrigeration"-5 to 60 hp. 12-page catalog "A New and Better Method of Personal Weather Control" the G-E Unit. Air Conditioning and Commercial Refrigeration Dept., General Electric Co.

4 Air Conditioning Units—Bulletin 107 describes the "Multitherm Unit" which heats, cools, gives complete conditioning. Designed to control temperature and humidity within close limits. Especially suited to small commercial problems. Clarage

Fan Co.

Evaporative Coolers—United States Air Conditioning Corp. Bulletins on evaporative coolers, including data on selling and installing, with mer-chandising helps. Also technical data on equipment and method. Other literature on wheels, housings, light duty assemblies.

ACCESSORY ITEMS

Filters-Fiberglas Dustop Air Fil-6 ters and Frames is the title of a 12-page catalog of replaceable filters for all types of air conditioning and

central heating systems and units, by Owens-Corning Fiberglas Corp.

Controls—12-page condensed catalog and price list for heating, air and trivial and price list for heating. conditioning and refrigerating controls. White-Rodgers Electric Com-

Water Pump-Literature describ-8 water ruling motor mounted pump (centrifugal type) for water circulating, spray and cooling tower service. Weil Pump Co.

9 Velocity Meter-Folder fully illustrated explains the electrical method of direct reading of air velocities. Explains how instruments are calibrated. Contains complete description of all types of this instrument. Full page chart shows positions used for field testing and how to operate instrument. Illinois Testing Laboratories, Inc.

10 Damper Regulator—Circular illustrating and describing the M. A. Gerett Corporation damper regulat-

FANS AND BLOWERS

Simplified Selector Chart - A pocket catalog and Simplified Selector Chart illustrates the Rex Air-Pak and gives dimensions. Air Controls, Inc., Div. Cleveland Heater Co.

12 Planing Mill Exhauster—Bulletin No. 430-1 (16 pages) by B. F. Sturtevant Company, covers their Design Four Planing Mill Exhauster with a table of dimensions, capacity tables, performance data and friction loss in pipes.

13 Blower Wheels-New bulletin by Torrington Mfg. Co., gives complete information on wheels, housings, blades, etc. Also includes performance ratings and housing scroll designs. Describes punched and peened end rings, blades, hubs.

Tools-Catalog No. 23A-wrenches, 14 pliers, screwdrivers, hack saws, tinners' snips, punches, chisels and other hand tools-by Crescent Tool Co. Indexed.

15 Fans and Blowers—Complete cata-log of fans and blowers for processing, manufacturing, industrial applications in exhausting, collecting, drying, material conveying and heat

circulation. Garden City Fan Co.

| 6 Warm Air Circulator—4-page circular illustrating and describing the "Magic Wheel" warm air circulator-a fan that is inserted in the top of the furnace to circulate the air over the crown of the firebox. Glea-

soft-Avery, Inc.

Pillow Blocks--Catalog No. 40 (20 7 pages) is entitled "Pillow Blocks — self-aligning, self-lubricating."— by Randall Graphite Products Cor-

poration.

18 Fans-Nozzles—An 8-page folder covers "Buffalo" fans for commercial and industrial ventilation, made by Buffalo Forge Company (Bulletin 3222-A). A 4-page folder (Bulletin 3186) covers the "L" Breeze fans for use with ducts. Another 8-page folder covers "Buffalo" spray nozzles and pot strainers (Bulletin No. 481-C).

19 Effective Summer Cooling—A 6-page folder entitled "Effective Summer Cooling with Viking Attic Ventilation" by Viking Air Condition-

ing Corporation.

20 Attic Fans and Room Coolers— Summer Comfort is the subject of three pieces of literature by The Lau Blower Co. An 8-page catalog gives the theory of night air cooling with an attic package unit, with instructions for selecting proper size grille and installing the unit.

2 Ventilators — Catalogs by Burt Mfg. Co., describe roof ventilators, oil filters, exhaust hoods, gravity and fan exhaust and engineering service

WARM AIR FURNACES

22 Winter Air Conditioners — A 6-page folder illustrates the Series 10 and a 12-page catalog covers the Series 20, gas-fired gravity and winter air conditioning furnaces with specifications. The Forest City Foundries Co.

Indicate the literature you want on reverse side of this card. No postage needed.

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23Stoker-Fired Winter Air Condi-tioners—Leaflet illustrating the Moncrief stoker-fired winter air conditioners. Series ST manufactured by The Henry Furnace & Foundry Co.

24Just What Is a Fair Price for a Furnace—A 16-page booklet being distributed by The Meyer Furnace

Company.

25 Condensed Catalog—A 60-page catalog with a complete story on the L. J. Mueller Furnace Company organization in the heating business over eighty years. The Mueller line features units for all types of heating -gravity or forced air and all fuels.

26Catalog Sheets — Superior Gas Floor Furnace, floor grille, dual register furnace and single wall register furnace; Pacific Model B-13 gravity gas furnace; Superior Model 8-SG gravity gas furnace; Pacific Thermolator Model 2-TV; Pacific Model A-81 Forced Air Unit; Pacific Model "B" automatic water heater. Pacific Gas Radiator Co.

27Coal, Oil, Gas—Nine 4-page catalogs illustrate and describe the Rybolt furnace series, cast iron and steel, gravity and air conditioning furnaces, using coal, oil and gas. The

Rybolt Heater Co.

28 Oil A. C. Furnace—A dimensions and data sheet for the new oilfired air conditioning unit, the Controlaire, is being distributed by the St. Louis Furnace Mfg. Co.

29 Gas A. C. Furnace—A 4-page folder covering the Payne Zoneair unit, a gas-fired furnace that offers winter air conditioning plus zoned heating. Payne Furnace & Supply

Company, Inc. 30 Direct-Firen Committee the direct-fired air conditioners for residential heating is being distributed by Fitzgibbons Boiler Company, Inc.

3 Coal-Fired Furnace—A folder covering the coal-fired Vernois furnace is being offered by Mt. Vernon

Furnace & Mfg. Co.

320il Burning Furnace—Literature describing new steel, oil-fired, winter air conditioner, employing new heat transfer principle. Easy to install since all parts are die formed

and welded. Morrison Steel Prod-

33 Gas-Fired Furnace A long the Gas-Fired Furnace-A folder il-Tropic Breeze Hi-Boy model winter air conditioner is being distributed by the Dalzen Manufacturing Com-

pany.

34 Oil Burning Furnaces—Illustrated folder describes eight models of oil burning furnaces-55,000 to 100,-000 Btu at the bonnet. For basement or utility room. Vaporizing type burners. Models designed for low Viking Mfg. cost house market. Corp.

350il Burning Furnace—Literature describing an oil-fired winter air conditioner designed for low cost houses of 65,000 Btu heat loss or less. Cleveland Steel Products Corp.

HUMIDIFIERS

36 Automatic Humidifiers — Catalog sheet (Form No. 701) shows eight humidifiers with description and list prices. Heating specialties, automatic water line control valves and water softeners are also shown. Maid-O'-Mist, Inc.

37 Vapor Diffuser—A 2-page folder covers the Flotrol humidifying systems by Monmouth Products. Co. 38 Humidifier—Badger Mfg. & Sales Co. Literature describes new stainless steel pan humidifier with adjustable float and automatic valve in chamber outside hood. Especially practical for liming conditions.

39 Humidifier Water Control—A 4page folder covers the McDonnell Miller humidifier water control

with snap-action.

REGISTERS AND GRILLES

40 Gravity and Air Conditioning Registers and Grilles—Catalog No. 41, 20 pages, covers both vertical and horizontal adjustment, sidewall location, baseboard location, Band Iron frame Types A and B for sidewall installation, Type C for baseboard installation, and damper control sets. Two pages are devoted to charts and information. Air Control Products,

This card should be filled in completely in order to secure the literature you request. Please indicate only the bulletins you particularly desire.

American Artisan

July

Please have the manufacturers send me without obligation the literature indicated by the following paragraph numbers

Company

Address

41 Air Conditioning Registers-Grilles
—Catalog No. 40 A C (50 pages) by Hart & Cooley Manufacturing Co. is both a catalog and engineering manual. Bulletin S27 covers the No. 69 line of registers for the low priced home. The 7th Edition Pocket Guide is a condensed catalog of both air

conditioning and gravity lines.

42Registers, Grilles, Intakes and Air
Control Devices—Catalog No. 40 covers air conditioning registers, grilles, intakes and air control devices made by Tuttle & Bailey, Incorporated, and is a reference guide in laying out any type of job. Charts give stock sizes, list prices, overall dimen-

sions, air capacities.

43 Ceiling Units—4-page folder illustrating and describing Barber-Colman air distribution outlets with tables of dimensions. Combination supply and return units or surface type Venturi-Flo outlets.

PIPE AND FITTINGS

44Furnace Pipe and Fittings—Catalog 38, 48 pages, features a line of registers, simplified fittings, furnace pipes and elbows, and furnace accessories, for heating systems and air conditioning. Catalog No. 39 A C (Series 700) covers prefabricated duct and fittings for forced air heating and air conditioning systems. Lamneck Products, Inc.

45 A. C. and Gravity Pipe and Fit-tings—General catalog Number 40 shows the complete line of heating equipment and supplies suitable for the installation of all types of gravity heating and A. C. systems. Char-

Gale Mfg. Co.

46 Furnace Pipe—Catalog No. 52, F. Meyer & Bro. Co. A complete listing (with illustrations) of single and double wall stack, stack fittings, stack cases, register boxes, adjustable elbows, shoes, bonnets, boxes, and items jobbed by the company.

MISCELLANEOUS

47 Stainless Steel Fabrication—"The Fabrication of Republic Enduro Stainless Steels" is the subject of a 40-page booklet by Republic Steel Corporation.

48400 (8 pages) with fifteen reasons for insulating ducts with asbestos protected Dux-Sulation, by Grant Wilson, Inc.

49 Tinners and Roofers Supplies— Catalog No. 12, 44 pages of tinners' and roofers' supplies. Berger Brothers Co.

50 Clean Heating Plants—"A Plan to Increase the Volume of Business for Dealers in Heating Plants" is the title of a book gotten up for heating men by The National Super Service Company.

5 | Bending Brakes—Catalog No. 13— Whitney Metal Tool Co. Contains information on bending brakes in 12 to 16 ga. and 4 to 10 ft. sizes. Also covers metal working tools.





100,000 new homes were built the first three months of this year. The Federal Government, July 1st, begins to spend \$15,000,000,000 during the next twelve months. Military, Naval and civil employment by the Federal Government during the next year or two is expected to increase from 2,250,000 to 5,500,000 persons. New offices and new living quarters for Government use are in process of planning and building by the Public Buildings Administration in all parts of the country. The RFC is on the eve of launching into a colossal program of financing the expansion of many industrial plants and of building plants which the Government will either operate itself or lease to private operators. The Advisory Commission to the Council of National Defense, headed by William S. Knudsen, which now makes the balls which other Government agencies pitch, shortly will be in direct control of the administration of the National Defense program. One of its greatest problems is where to purchase and how to purchase.

One agency today is making a survey. It may come to your shop or your plant or your warehouse to find out what you have on hand, what you can do in the future, how many you employ, and what potentialities your business offers. Military supplies and supplies for civil agencies, now procured through 6,000 to 8,000 officials scattered around the United States and elsewhere, under the Knudsen regime, will be purchased through 20 regional centers, under the direction of Donald M. Nelson, the Sears, Roebuck executive, who recently became Procurement Officer of the Treasury.

Incidentally, the extraordinary need for artisans of all kinds will undoubtedly quickly bring the demand that shops and plants of all types and sizes take in apprentices for mechanics' training. It also is interesting that the Government reports the clean up, fix up campaign in the Waverly neighborhood of Baltimore within 6 weeks brought down all "For Rent" signs, and over half the "For Sale" signs. (See Kruckman, June, 1940, issue.)



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Spray Paint Booth And Drying Oven

(Continued from page 59)

iron framing was made and the covering sheets fabricated for standing seam application (see photograph). The spray booth and air supply and exhaust equipment were then located with reference to the oven.

Spray Booth Assembly

The spray booth is composed of a standard back with curtains and a specially built operating platform. The spray booth elevation shows details of booth construction and the photographs show actual completion.

The spray booth is located in an air tight room furnished with equipment. About 18,000 cfm. of air are supplied to this room, while about 15,000 cfm. are exhausted from this room. Supply air to the booth room is heated, filtered, humidified or dehumidified to exact dry and wet bulb conditions. This is important because temperatures and humidities are critical with certain types of paint or enamel.

Exhaust System

The exhaust air is pulled up through the booth as shown in the elevation. The impingement plates and the helixes remove practically all water and spray paint. The mixed waste paint and water return to a tank beneath the floor and into a sludge tank. Reclaimed paint, even mixed colors, can be used for underbody work.

Construction of supply and exhaust ductwork follows standard practice as to gauges, seams, reinforcing, etc., as the photographs show. There is, as the plan shows, a supply system for the airtight spray room and an exhaust system for this same room. Conditioned air for the oven is introduced by a fan mounted on the far end of the oven and discharging air uniformly through the oven from slots in a duct which lies on the oven floor, along the center line.

The oven air can be circulated through this fan or the fan can pull from the open floor and the air exhaust through a separate gravity flue, as shown. Whether recirculation or new air is used depends on the item being painted and on the type of paint, enamel or lacquer being used. In this system drying time is about 1 hour at 225 to 250 deg. F.

Death of Mrs. Fred Bishop

Mrs. Fred Bishop, wife of Fred Bishop of Detroit died Saturday, July 6. Burial was in Grand Lawn cemetery. The hundreds of friends of Fred will, we know, join us in sympathy.

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THIS TIME

out timing or compli mathematical calcula the Velometer give the Velometer they check and balance a syst in one tenth the time for merly required, and Velometer gives them picture of air distributiat no other instrumeran. Write for details.

Bookkeeping By Dingle

(Continued from page 82)

keeper should be furnished with a properly designed system of accounts, properly installed. She should have a proper place at which to work, and she should have the full co-operation of each and every employe.

If you are one of those fellows who judge the success or failure of your business by the amount of your bank balance, there is a lot for you to learn. Money in the bank is fine, but where did it come from and to whom is it owing? Is it sufficient to meet your obligations, and do you have a supply of materials on hand; do you have a steady flow of collections to keep your business active?

When you have such a system of bookkeeping as will present in usable form data pertaining to your operations, and the relation of each account to the others, you will be in a position to better control your business. You will be better equipped to earn satisfactory profits and these profits will not all be at the expense of your customers. Much can come from the stopping of waste and the elimination of unnecessary expense.

Last Summer, we were in French Canada, and not being able to speak French, we were unable to communicate directly with the French Canadians who spoke no English. Of course, if we were to take up our residence in that part of the country we would promptly undertake the study of French in order that we might at least talk to our neighbors. Unless we had a complete mastery of French, we might find ourselves unable to make ourselves fully understood. If, on the other hand the French should attempt to learn English, then, if we could not converse in French, we might try our hand at English, and in this way make our points of contact all the more complete.

You, Mr. Business Man, talk the language of your business, but you do not talk the language of your bookkeeper. On the other hand, your bookkeeper talks the language of her craft, but not the language of business. Suppose that you try to master the terms of her craft and she in turn understands some of your business language. The result will be a more perfect understanding of the language of the other, and much benefit can accrue from this.

Your bookkeeper can help you bring more profit into your business. Start today with the determination to establish an adequate bookkeeping system in your business; take the bookkeeper through the shop and explain to her the work that goes on there. Take her to some completed job and show her the fruits of the labor of your organization. Then allow her to tell you just what those things mean in her bookkeeping records.

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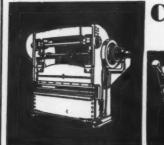
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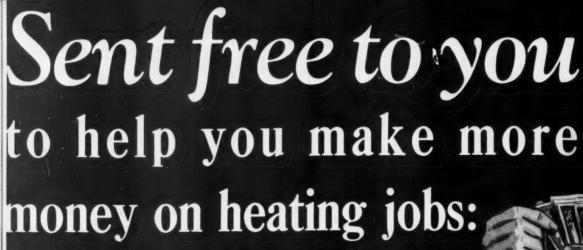
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